

ZS 72

BRITISH BIRDS

WITH WHICH WAS INCORPORATED IN JANUARY, 1917, "THE ZOOLOGIST."

AN ILLUSTRATED MAGAZINE DEVOTED
CHIEFLY TO THE BIRDS ON THE BRITISH LIST

EDITED BY

H. F. WITHERBY M.B.E. F.Z.S. M.B.O.U. H.F.A.O.U.

ASSISTED BY

NORMAN F. TICEHURST O.B.E. M.A. F.R.C.S. M.B.O.U.

AND

BERNARD W. TUCKER M.A. F.Z.S. M.B.O.U.

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326 HIGH HOLBORN LONDON

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JUN 1941
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BRITISH BIRDS

AN ILLUSTRATED MAGAZINE
DEVOTED CHIEFLY TO THE BIRDS
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JUNE 3,
1941.

Vol. XXXV.
No. 1.



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NOMENCLATURE.

As it is hoped very shortly to publish the final volume of *The Handbook of British Birds*, which will contain a full systematic list, the names in this list will be used in the present volume of BRITISH BIRDS.

In the species described in the last volume of the *Handbook* the only changes of names now being used are *Larus glaucoides* Meyer in place of *L. leucopterus* for the Iceland Gull and Corn-Crake instead of Land-Rail.

SOME NOTES ON THE LONG-EARED OWL

BY

ERIC J. HOSKING, F.R.P.S., M.B.O.U.

(Plate I.)

THERE does not appear to be a great deal of literature concerning the nocturnal habits of the Long-eared Owl (*Asio o. otus*), and, to a large extent, this can be understood as observations during the hours of darkness are difficult, and sometimes impossible. The Long-eared Owl is probably the most nocturnal of all our owls and is not often seen on the wing, either hunting or displaying, during day-time. It is true that it does hunt before dusk and is on occasion afield after dawn, this being particularly the case on a day following incessant wet weather when its prey remains under cover ; and during the middle of the winter when there is a scarcity of food. But, generally speaking, it remains at roost throughout the day. It was with the view to discovering something more of this owl's nocturnal life that I devoted several whole nights, interspersed with some periods of daylight, observing from a hide only seven feet from a nest.

The nest was found in Norfolk by a friend. It was situated in a small wood composed mainly of Scots pine trees, intermingled with spruce firs ; the nest being in one of the latter trees, 23 feet above ground. I believe that the nest was originally built by a Carrion-Crow and was constructed of pieces of pine wood, varying in length from a few inches to over a foot ; there was little lining, but a few pieces of dead bracken were scattered over the nest. All five eggs were laid before the nest was found, and round these were a few dark greyish feathers which had probably fallen from the breast of the hen Long-eared Owl.

The first period of observation from the hide took place on April 27th, and began at 10.30 a.m. Directly I was left on my own, the hen started to come back and I could see her flying from tree to tree as she came nearer. From each halting place she would glare at the hide, first bowing very low so that her chin almost touched the branch on which she was perched, then suddenly she would stand to full height, and without removing her glance from my direction, she would sway her body from side to side. As I have noticed these actions at other Long-eared Owls' nests I do not think that they were actuated by the hide, but represented the typical method of approach. Once she had perched by the nest I was able to obtain a remarkably good view of the facial disc, and saw how it was brought right forward so as to give



LONG-EARED OWL

Female feeding chick. The prey—a rat—can be seen in front of her head.
(Flashlight photograph by Eric J. Hosking.)



a much more terrifying effect, the horns or ear-tufts being placed flat along the crown of the head. Under normal conditions, when the bird is not excited, the face is rather pinched, and has a shrunken appearance. As the brooding patch was relaxed ready to envelop the eggs the owl moved forward and lowered herself. For hours on end she remained thus, and only twice in eight hours did she even alter her brooding position.

Throughout the whole of my day and night observations the cock did not take any share in the incubation of the eggs, nor did he ever appear at the nest during the day. Soon after dark he would usually call from a nearby tree, the hen would then leave and presumably go to feed, a similar performance taking place about half an hour before dawn. No food was brought to the nest prior to the hatching of the eggs.

A short nuptial display was witnessed on April 28th at 8.25 p.m. The hen was away from the nest and was perched on a tree a short distance from the hide. She called and was immediately answered by the cock. He then flew towards her, keeping well below the tops of the trees, dipping and rising, and circling round the trunk of the tree on which the hen was perched. For the most part he glided but every now and again would clap his wings. I was unable to see whether the wings made contact below or above his body as the thickness of the pine trees obstructed much of my view. Finally the cock alighted by the side of the hen and there called—the note might be described as a low moan. The hen left the perch and came directly back to the nest.

The first chick hatched during the early morning of May 2nd. During the night the cock made his first appearance at the nest and brought in food. In all three visits were made, and although I was not able to see what food he brought, I found on the nest after dawn two short-tailed field-voles and one rat, all of which were decapitated. To me this was a most interesting thing, because this was the first food to be seen at the nest, and it coincided with the hatching of the first egg.

All five chicks were hatched by noon on May 4th. Owls in general lay their eggs on alternate days; sometimes three or four days may elapse between them, and as a rule incubation starts with the laying of the first or second egg. However, in this particular instance the hatching of all five chicks took place in a little over two days, which suggests that incubation did not begin until the laying of the penultimate



LONG-EARED OWL.

Male returning to nest with rat. Female brooding small chicks.

(Flashlight photograph by Eric J. Hosking.)

egg. I witnessed something similar in a nest in Suffolk in 1935 when I found three chicks of about the same age, while the fourth was only a little larger, and I think that it sometimes happens that the hen will cover the eggs but not incubate them properly until the full clutch is nearly completed.

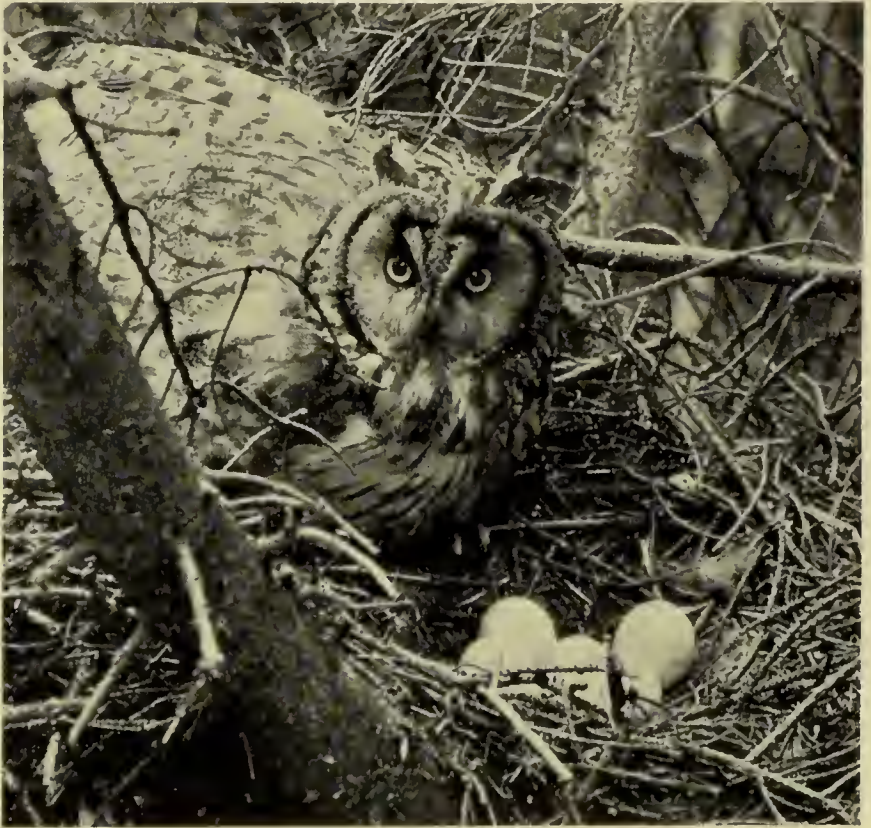
Throughout all the hours of daylight there was no activity at the nest, and no attempt was made to feed any of the owlets. With the approach of dusk, however, a change took place. Suddenly quite close to the nest there came a long drawn-out hooting "ooo-oo-o," which was answered by the brooding hen, whose call might be likened to the sound made by drawing in air from a comb and tissue paper. An exchange of calls followed, in the course of which the hen became very excited and started to quiver and vibrate her wings. This exchange of calls continued for ten minutes, at the end of which time the cock flew into the nest. It was still just light enough to see that a young rat dangled from his bill. Both birds were now very excited, the hen quivering her wings as she reached up to the cock, while he slowly flapped his wings and rolled his body from side to side, clutching and unclutching at the branch on which he was perched. Both called in subdued tones, and the hen took the rat from the cock, placing it on the nest just in front of her. The cock having delivered the prey, left immediately. The ceremony just described was typical of those which took place on each occasion that food was brought to the nest by the male bird.

Feeding the owlets followed. The hen, without rising from her brooding position, stretched out the tarsus and gripped the prey in her talons, also gripping part of the nest, then, leaning forward, she pulled at the rat with her bill. Several attempts were made before a portion of the prey became detached, and in the initial efforts this consisted mainly of fur, which she herself swallowed. Once the red meat was reached tiny morsels were plucked and passed under her body to the chicks, who were sheltering below her. It was observed that the food had to touch the chick's beak before it would open its mouth to receive it. If the portion proved too large for one chick, it was offered to another, and if none of the chicks would take it, it was eaten by the hen. Each one of the chicks was fed at every meal, and gorged to such an extent that at its conclusion they were incapable of movement. The remains of the prey were then swallowed by the hen. This was followed by an attempt to clean the nest of the small pieces of food which had fallen into it.

It will be observed from this description that the method

of feeding was different from that adopted by hawks, which usually stand by the side of their young during the operation.

While the hen was brooding the chicks the cock paid on an average five or six visits to the nest between dusk and dawn, and so far as I could ascertain food was brought on each occasion. During the hours of complete darkness it was not, of course, possible to discern exactly what was taking place, but the exchange of calls and rustling of wings were



LONG-EARED OWL.

Female in aggressive attitude.

(Daylight photograph by Eric J. Hosking.)

similar during darkness to those at dusk, and it seems reasonable to presume that similar actions accompanied them.

So far as I was able to ascertain, the male's hunting territory was restricted to quite a small area. The nest, as already mentioned, was in the middle of a small plantation, which was surrounded by an area of heather and bracken intermixed with silver birch trees. Small stacks of dead bracken were to be found at points round the plantation. The Long-eared Owl's hunting-ground consisted of the area immediately

round the wood, amongst the bracken stacks—where I had often noticed rats—and in the wood itself. Throughout the night it was possible to hear him calling at approximately ten minute intervals, and generally these calls were answered by the hen. During the early hours of one morning when it was still dark, the cock called very loudly while flying near to the nest. The call was entirely different from others used, and I should describe it as “whack-ack-ack.” The hen,



LONG-EARED OWL.

Female brooding eggs. Note difference in facial disc in photograph of aggressive attitude. (*Daylight photograph by Eric J. Hosking.*)

who was brooding, replied also with an unusual note, a “whoof-whoof”—a sound made, I think, by blowing air through her nostrils. After this there was complete silence for over an hour, and I was of the opinion that on this occasion the cock had flown out of his usual territory.

On only one occasion did I see the hen actually bring food into the nest. It was just after dawn, and she had left after spending the whole night brooding the chicks. In all she stayed away for sixteen minutes. Just before her return I heard the two birds exchanging calls, and a moment later

there was a light thud on the ground, followed by a rustling of leaves. What I think happened was that the male dropped the prey he had brought to the hen, and she had retrieved it and brought it back with her. The food she brought was particularly interesting because it was the remains of a full-grown rat, the first to be seen at this nest, all the other rats being young of various sizes. The late Dr. C. B. Ticehurst, the results of whose analysis of many pellets were published in *The Ibis*, July, 1939, could find no evidence that fully grown rats formed part of the diet.

The prey consisted of rats, field-mice and field-voles; within five days of hatching the following were brought to the nest and actually observed: 19 rats, 7 field-mice and 2 field-voles. Other prey was, no doubt, brought in but was eaten during darkness and consequently not seen. A few pellets were examined and these contained rodents and, more rarely, rabbits. No trace could be found of either birds or insects.

A. C. Bent, writing of the nearly allied American form, *A. o. wilsonianus*, in his *Life Histories of the North American Birds of Prey*, says, "Whether the Long-eared Owl hunts to any great extent during the darkest hours of the night we do not know." Without doubt I can say that it does and very successfully too, as on occasions I have shone a torch on to the nest immediately after the cock had left and seen fresh prey. What does seem remarkable to me is that this owl is able to fly through thick, inter-twining and dense forests in the pitch blackness of the night. The male at the nest I was studying came quite often to the nest when it was so dark I could not even see the least reflection of light from the sky, and, moreover, alighted on the branch immediately behind the nest without hesitation or losing his balance, as I could tell from the sound of his claws on the branch.

Ornithology presents many surprises, but this ability of the owl to see well enough to hunt and to thread its way through the intricacies of a wood in what appears to be utter darkness to human eyes is probably one of the most astonishing. It appears that the subject would be one of great interest for physiological study.

It was very unfortunate that I was not able to stay longer in this neighbourhood and study the breeding biology more thoroughly. However, my friend visited the nest frequently and advised me that all five chicks left the nest on May 25th. As the chicks hatched between May 2nd and 4th, this made their fledging period 21 to 23 days, coinciding almost exactly with that given in *The Handbook of British Birds*.

A PUBLICATION OF THE BRITISH TRUST FOR
ORNITHOLOGY.
REPORT OF THE BIRD-RINGING COMMITTEE:

PROGRESS FOR 1940.

A. LANDSBOROUGH THOMSON, C.B., D.SC., F.R.S.E.

Chairman of the Committee.

THIS is the fourth annual report to be issued on behalf of the Bird-Ringing Committee of the British Trust for Ornithology.* It covers 1940, the third complete year of working under present arrangements. The series in this form continues the sequence of annual reports by H. F. Witherby, published from 1910 onwards under the general title "*The British Birds Marking Scheme.*"

The war has inevitably curtailed the activities and results in various ways, but much useful work has nevertheless been accomplished.

MANAGEMENT.

The headquarters of the work remain in the Bird Room of the British Museum (Natural History) at South Kensington, by kind permission of the Trustees. All new rings are inscribed "BRITISH MUSEUM NAT. HIST. LONDON."

The composition of the Committee remains as before. The Honorary Secretary, Miss E. P. Leach, is responsible for the whole of the headquarters work, including all correspondence, records and accounts, as well as the issue of rings. During the year she had been giving the greater part of her time to these duties without assistance, and it is entirely due to Miss Leach that the Scheme has been so well maintained in face of present difficulties.

FINANCE.

Subscriptions have naturally fallen off, but the Committee are grateful to those who have found it possible to continue their help. The Committee were not in favour of raising the price of rings, and this stands at 6s. per hundred. A subvention from *British Birds* has again been received, and the special grant made by the trustees of the late Viscount Leverhulme has been drawn upon.

The accounts for 1939 and 1940 have been published in combined form in the Seventh Report of the Trust.

PROGRESS OF RINGING.

Many ringers have been called up for national service of various kinds. Not only has this affected individual ringers, but the Natural History Societies have been unable to collect

*The previous report was published in *British Birds*, 1940, Vol. XXXIII, p. 318.

schedules from some of their members, and birds are known to have been ringed although no details are forthcoming. The following figures are based on the schedules actually sent in. The total of birds marked during the year is 21,182, and it will be seen from the tables that the trapped birds greatly exceed those ringed as nestlings, the relative numbers being 14,974 and 6,208.

Dr. Moon's and Mr. Cooper's names will be missed from the head of the list, and it is a source of great regret that their duties have prevented them marking more than 2 birds. As an offset to the temporary loss of so many ringers, it is pleasing to be able to report that 17 new ringers have joined during the year.

A few outstanding items from the lists may be specially mentioned. The first Hoopoe to be ringed under the scheme was marked at Skokholm, and a brood of five Black Redstarts was ringed in another locality—the only young ones ever marked except for those at Cambridge in 1937. Messrs. Mason and Williams have ringed a number of Corn-Crakes in Co. Dublin, being responsible between them for 30 adults and 13 young. Nobody was able to go far afield, and one consequently misses the birds usually marked on the outlying islands in considerable numbers.

ECONOMY IN THE USE OF RINGS.

A fair stock of rings is still held, but the measures of economy in their use introduced last year remain in force and must be strictly observed. Further supplies of aluminium cannot be expected during the war.

METHODS.

The use of ring-size 1A for Greenfinches, previously advised, is now a definite instruction, as it has been found that the birds distort and probably remove the smaller and less stout ring No. 1.

RECOVERIES.

Recovery records have continued to come in reasonably well. In this country valuable help in reporting recoveries has been given by local police, as a result of an official circular to Chief Constables. (This has extended to birds with foreign rings, which have been the subject of some suspicion on the part of members of the public ignorant of the purposes of marking.) As regards recoveries abroad, records have been received even from enemy countries, through ringing stations in neutral territory.

A few individual cases of special interest may be mentioned. Among these is that of a Kestrel, ringed as a nestling in Surrey, being reported alive in Navarre and released there

again. A Redwing was ringed in Cornwall and recovered the following winter in northern Italy : this was included in a special note on the movements of Redwings. An unusual Blackbird record is that of one ringed at Woodford Green, Essex, in January, 1940, and recovered at Port Patrick, Wigtownshire, in February, 1941.

A Common Redstart, ringed as a nestling in Northumberland, was caught in the same place after an interval of four years. A Kingfisher which travelled from Cheshire to Yorkshire, a distance of 76 miles, shows a more extensive movement than any other record yet made. A young Teal from the Isle of Man was shot in January in the Asturias, and another instance is recorded of a Sandwich Tern rounding the Cape and moving up the east coast to the neighbourhood of Durban.

PUBLICATION OF RESULTS.

The following publications have been made for the Committee since the last Report :—

E. P. Leach (1940) : " Recovery of marked birds." *British Birds*, Vol. XXXIV, pp. 36 and 61.

E. P. Leach (1941) : " Recovery of marked birds." *British Birds*, Vol. XXXIV, p. 172.

E. P. Leach (1941) : Note on " Redwings wintering in widely separated areas in successive years." *British Birds*, Vol. XXXIV, p. 243.

In addition, Chapters VI and VII in Volume I of the report of the International Wildfowl Inquiry deal in part with results of the ringing scheme :—

C. W. Mackworth-Praed (in part) and anonymous (1941) : " Ringing of duck at British decoys for the Wildfowl Committee." *International Wildfowl Inquiry*, Vol. I, p. 64.

A. L. Thomson (1941) : " Results of ringing duck : general survey of data from all sources." *International Wildfowl Inquiry*, Vol. I, p. 84.

NUMBER OF BIRDS RINGED.

				<i>Trapped.</i>	<i>Nestlings.</i>	<i>Total.</i>
In 1940	...	...	...	14,974	6,208	21,182
„ 1939	...	...	...	27,983	27,834	55,817
„ 1938	...	...	...	24,162	26,162	50,324
„ 1937	...	...	...	21,900	23,281	45,181
„ 1936	...	...	...	19,235	29,428	48,663
„ 1935	...	...	...	16,066	30,364	46,430
„ 1934	...	...	...	17,835	31,816	49,651
„ 1933	...	...	...	10,466	27,975	38,441
„ 1932	...	...	...	7,643	22,950	30,593
„ 1931	...	...	...	7,041	22,513	29,554
From 1909 to 1930	...	...	...	...	...	287,401
Grand Total (including arrears)				703,640		

	<i>Trapped.</i>	<i>Nest- lings.</i>	<i>Total.</i>		<i>Trapped.</i>	<i>Nest- lings.</i>	<i>Total.</i>
Bootham Sch.	1,706	173	1,879	M. Stewart	95	16	111
Oxford Orn.S.	1,570	115	1,685	D. Garnett	86	17	103
A. Darlington ...	877	782	1,659	Mrs. Cornish	101	—	101
Skokholm B.Obs.	785	392	1,177	Rochester N.H.S.	79	12	91
A. J. Harthan ...	938	47	985	R. H. Brown	2	89	91
G. Charteris ...	431	281	712	H. Tully	75	14	89
Clayesmore Sch.	605	15	620	P. Maclaren	49	28	77
Gordonstoun Sch.	546	65	611	Mrs. Gaskell	32	37	69
London N.H.S.	427	166	593	Miss Medcalf	57	12	69
A. W. Boyd ...	406	134	540	Manx Field Club	18	45	63
Rugby School	21	438	459	A. E. Billett	—	59	59
J. A. Gibb ...	423	18	441	Miss Steinthal	58	—	58
Mrs. Hodgkin ...	3	438	441	W. Pollok-Morris	2	55	57
J. Buxton ...	380	4	384	Wildfowl Inq.	56	—	56
G. M. King ...	358	—	358	W. A. Cadman	5	51	56
Charterhouse B.C.	279	69	348	Cheltenham Coll.	3	48	51
A. Wainwright...	282	55	337	V. H. Spry ...	—	48	48
E. Cohen ...	296	39	335	Sandford, Stephen,			
H. W. Robinson	80	231	311	& Pollok-Morris	3	42	45
M. Wainwright...	304	—	304	Lord D. Stuart...	3	41	44
Christ's Hospital				J. Bartholomew	3	40	43
N.H.S.	241	18	259	Winchester Coll.	16	25	41
F. J. Brown ...	242	12	254	Miss Henderson	—	39	39
J. Barnes ...	150	103	253	Miss Hutchinson	—	39	39
H. M. Rogers ...	59	190	249	H. G. Alexander	37	—	37
Sedbergh Sch.	14	209	223	Oakes and			
Leighton Park S.	171	50	221	Battersby ...	—	34	34
A. H. Bishop ...	194	14	208	Mrs. Priestley ...	24	9	33
D. Lack...	198	10	208	H. C. Trimnell	11	22	33
P. Morshead ...	181	25	206	L. D. Thomas	30	—	30
Zool. Society ...	126	73	199	E. Wishart ...	1	25	26
Kingswood Sch.	73	124	197	N. H. Joy ...	26	—	26
P. Hollom ...	182	13	195	F. A. Nattrass	8	16	24
Miss Ferrier ...	32	160	192	P. M. Jeavons ...	7	17	24
M. & D. Rankin	81	108	189	J. Law ...	23	—	23
G. Paulson ...	179	7	186	Lord Dumfries	6	17	23
Cowin & Ladds	42	140	182	Bedale's School	—	21	21
R. Martinson ...	26	147	173	Repton School ...	—	20	20
Bryanston Sch.	167	—	167	F. J. Ramsay ...	12	8	20
Brooker & Cawkell	38	119	157	J. Ellis ...	12	7	19
R. M. Garnett ...	140	12	152	Mrs. Anscombe	—	16	16
Dauntsey's Sch.	148	—	148	W. Macve ...	14	2	16
J. Cunningham	146	1	147	C. Foster-Barham	1	10	11
Cambridge B.C.	136	7	143	Shrewsbury Sch.	8	—	8
L. F. Weller ...	105	29	134	K. Keywood ...	—	7	7
C. G. Tebbutt ...	99	17	116	P. A. Rayfield ...	—	7	7
R. Carrick ...	50	61	111	R. A. Humphries	1	—	1

NUMBERS OF EACH SPECIES RINGED.						RECOVERED	
	1909 to 1939	1940		Total	Grand Total.	of those ringed 1909-39	Per centage
		Trapped	Nest- lings.				
Raven ...	188	—	26	26	214	14	7.4
*Crow, Carrion	1462	2	124	126	1588	71	4.9
Rook ...	4916	25	70	95	5011	234	4.8
Jackdaw ...	3939	51	2	53	3992	181	4.6
*Magpie ...	1004	5	65	70	1074	34	3.4
Jay ...	479	3	16	19	498	30	6.3
Chough ...	43	—	1	1	44	3	7.0
Starling ...	62532	6098	166	6264	68796	2779	4.4
Greenfinch ...	28231	1229	47	1276	29507	1865	6.6
*Goldfinch ...	461	8	5	13	474	8	1.7
Redpoll, Lesser	588	1	—	1	589	6	1.0
Linnet ...	10064	6	94	100	10164	69	0.7
Bullfinch ...	1555	9	8	17	1572	58	3.7
Chaffinch ...	32286	877	44	921	33207	1392	4.3
Brambling ...	997	9	—	9	1006	38	3.8
Sparrow, Tree	2261	3	66	69	2330	47	2.1
Bunting, Yellow	5526	101	29	130	5656	276	5.0
Bunting, Reed	1842	6	13	19	1861	89	4.8
Lark, Sky ...	3652	21	1	22	3674	45	1.2
Pipit, Tree ...	1773	—	12	12	1785	5	0.3
Pipit, Meadow	5353	48	28	76	5429	†114	2.1
Pipit, Rock	637	10	21	31	668	29	4.5
Wagtail, Yellow	1042	—	11	11	1053	4	0.4
Wagtail, Grey	833	—	15	15	848	1	0.1
Wagtail, Pied	6534	17	61	78	6612	89	1.4
Wagtail, White	79	—	—	—	79	—	—
Flycatcher, S.	3398	9	16	25	3423	11	0.3
*Flycatcher, Pied	1382	—	—	—	1382	9	0.6
Chiffchaff ...	897	36	17	53	950	5	0.6
Warbler, Willow	10340	58	4	62	10402	52	0.5
Warbler, Wood	1009	1	12	13	1022	2	0.2
Warbler, Sedge	1266	10	13	23	1289	7	0.5
Warbler, Garden	1275	12	5	17	1292	5	0.4
Blackcap ...	897	4	18	22	919	2	0.2
Whitethroat	4713	113	7	120	4833	27	0.6
Thrush, Mistle	4627	43	73	116	4743	101	2.2
Thrush, Song	66684	410	626	1036	67720	1302	1.9
Redwing ...	930	31	—	31	961	7	0.7
Ouzel, Ring ...	523	—	7	7	530	5	1.0
Blackbird ...	58518	1436	550	1986	60504	2686	4.6
Wheatear ...	1863	10	—	10	1873	39	2.1
Whinchat ...	1633	—	3	3	1636	12	0.7
Stonechat ...	838	2	1	3	841	5	0.6
Redstart ...	2071	2	12	14	2085	15	0.7
Robin...	22642	651	71	722	23364	2106	9.3
Sparrow, Hedge	14831	386	31	417	15248	1331	9.0
Wren ...	3722	57	—	57	3779	21	0.6
Dipper ...	1316	7	83	90	1406	16	1.2
Swallow ...	43043	40	795	835	43878	406	0.9
Martin ...	11671	56	241	297	11968	80	0.7
Martin, Sand	4570	37	—	37	4607	11	0.2
*Swift ...	964	3	5	8	972	60	6.2
Kingfisher ...	702	—	5	5	707	31	4.3
Cuckoo ...	731	2	11	13	744	20	2.7

	NUMBERS OF EACH SPECIES RINGED.				Grand Total.	RECOVERED	
	1909 to 1939	Trapped	1940 Nest- lings.	Total		of those ringed 1909-39	Per centage
*Owl, Little ...	603	3	20	23	626	56	9.3
Owl, Long-eared	218	—	—	—	218	7	3.2
Owl, Barn ...	601	2	12	14	615	59	9.8
Owl, Tawny ...	954	2	33	35	989	59	6.2
Peregrine Falcon	81	—	3	3	84	7	8.6
*Merlin ...	243	—	10	10	253	50	20.6
Kestrel ...	915	1	24	25	940	93	10.2
*Buzzard ...	335	—	4	4	339	13	3.9
Hawk, Sparrow	520	3	20	23	543	74	14.2
Heron, Common	2127	—	62	62	2189	259	12.2
Sheld-Duck ...	473	—	—	—	473	22	4.6
Mallard ...	6857	16	14	30	6887	1104	16.1
Teal ...	2528	45	11	56	2584	311	12.3
Wigeon ...	418	6	—	6	424	59	14.1
Duck, Tufted...	177	—	—	—	177	36	20.3
Goosander ...	52	—	—	—	52	10	19.2
Cormorant ...	2456	—	—	—	2456	497	20.2
Shag ...	1846	—	32	32	1878	189	10.2
Gannet ...	10165	48	1	49	10214	339	3.3
Petrel, Storm	561	9	1	10	571	41	7.3
Shearwater, Mx.	19951	24	5	29	19980	†1007	5.0
Petrel, Fulmar	336	5	13	18	354	1	0.3
Wood-Pigeon	2785	4	34	38	2823	105	3.8
Dove, Stock	641	5	3	8	649	55	8.6
Dove, Turtle	634	21	6	27	661	74	11.7
Stone-Curlew	251	—	—	—	251	10	4.0
Oyster-catcher	1544	—	9	9	1553	63	4.1
Plover, Ringed	1456	7	28	35	1491	18	1.2
Plover, Golden	317	—	5	5	322	8	2.5
Lapwing ...	38671	1	506	507	39178	826	2.1
Dunlin ...	113	1	—	1	114	1	0.9
Sandpiper, C.	894	—	2	2	896	3	0.3
Redshank ...	2272	2	26	28	2300	79	3.5
Curlew, Common	3074	—	41	41	3115	125	4.1
Snipe, Common	1600	2	25	27	1627	84	5.2
Woodcock ...	5278	—	27	27	5305	400	7.6
Tern, Sandwich	17286	—	507	507	17793	311	1.8
Tern, Roseate	197	—	8	8	205	1	0.5
Tern, Common	19658	—	1	1	19659	470	2.4
Tern, Arctic ...	2562	—	165	165	2727	11	0.4
Tern, Little ...	808	—	—	—	808	8	1.0
Gull, B.-headed	13863	40	11	51	13914	651	4.7
Gull, Common	1814	5	1	6	1820	61	3.4
Gull, Herring	8632	3	37	40	8672	228	2.6
Gull, L.Bl.-bkd.	10676	—	41	41	10717	412	3.9
Gull, G.Bl.-bkd.	571	—	16	16	587	20	3.5
Kittiwake ...	1833	—	72	72	1905	25	1.4
Skua, Great ...	503	—	15	15	518	17	3.4
Razorbill ...	4196	41	311	352	4548	95	2.3
*Guillemot ...	2380	14	61	75	2455	52	2.2
Puffin ...	5318	82	4	86	5404	89	1.7
Crake, Corn ...	478	33	13	46	524	6	1.3
Moorhen ...	1649	24	7	31	1680	40	2.4

†Corrected figure from 1939.

OBITUARY.

GEORGE HENRY CATON HAIGH.

(1860-1941).

GEORGE HENRY CATON HAIGH, who died on February 11th, 1941, at the age of eighty, will be best remembered by ornithologists for the persistent and diligent watch he kept for rare migrants at North Cotes in Lincolnshire. His success in this quest was due to his very thorough and regular search at the period of the autumn migration of certain hedge-rows which border the sea-banks, rather than to anything specially favourable in the place itself. His finds extended over many years, one of the first of importance being a Yellow-browed Warbler in October, 1892, and this was made the subject of the figure in the second edition of Howard Saunders's celebrated *Manual*. Subsequently he recorded this species on no less than nine occasions. Two species, the Greenish Warbler (September 5th, 1896) and Radde's Bush-Warbler (October 1st, 1898) added to the British list by his discoveries have curiously enough never turned up again, but the Lanceolated Warbler, which he was the first to record in 1909, had, as was subsequently found, been taken the year before in Fair Isle. Among other rarities which came from North Cotes from time to time were Eversmann's Warbler, an Icterine, Barred Warblers (in six or more years), a Buff-breasted Sandpiper and a Yellowshank. Recently he presented his collection of bird-skins to the Natural History Museum.

Caton Haigh was held in great regard as a sportsman and we are indebted to his old friend Col. E. K. Cordeaux for some particulars. He was shooting up to the last year of his life, although for the last ten he was so crippled by arthritis as to have to go about on crutches. Although he enjoyed a good organized shoot, his chief delight was a very rough evening after Wood-Pigeons and nights on the Humber side fighting geese, at both of which pursuits he was an adept and very successful. He detested any unsportsmanlike action and was greatly perturbed recently by a wholesale and unsporting method of killing Pink-footed Geese, which was being practised in his neighbourhood.

He was a great lover of flowers and in Merionethshire he had a fine collection of rhododendrons.

He inherited from his father, George Henry Haigh, who died in 1887, his large agricultural estates in north Lincolnshire as well as properties in North Wales and Yorkshire.

MAUD DORIA HAVILAND

(Mrs. H. H. Brindley.)
(1891-1941).

MRS. BRINDLEY, who died under tragic circumstances on April 3rd, 1941, was always interested in Natural History and especially birds and first became well known among ornithologists (as Maud Haviland) after her visit to the delta of the Yenisei in 1914. Here she studied Grey Plover, Curlew-Sandpiper, Grey Phalarope, Little and Temminck's Stints and other interesting birds, some of which have been seen at their breeding-places by so very few British ornithologists. This expedition resulted in her contributing a number of interesting papers to this magazine (Vols. VIII, IX, X, XI, XII) and a book entitled *A Summer on the Yenesei* in which she described her experiences.

In 1917, as a member of the Scottish Women's Hospital, she served as chauffeur to Dr. Elsie Inglis in Rumania and had an adventurous journey home when the unit had to be evacuated via Archangel. In the following year she was again acting as chauffeur, this time under the French Red Cross in the Soissons-Paris region.

Shortly after the end of the War she went to Cambridge and commenced her researches on the Hemiptera-Heteromorpha, a group of insects which had already particularly attracted her interest. From 1919 to 1922 she was a Research Fellow of Newnham and she spent the early part of 1922 in British Guiana studying (under a joint Royal Society and Cambridge grant) those forms of these insects harmful to vegetation. The results were embodied in a report to the Royal Society. In 1924 she gave a course of ecological lectures at Cambridge based on observations made by herself and embracing those of others, these essays being subsequently published as a book under the title of *Forest, Steppe and Tundra*.

In 1922 she married Mr. H. H. Brindley, fellow of St. John's College. She was elected an Honorary Lady Member of the British Ornithologists' Union in 1916 and was a prominent member of the Cambridge Bird Club.

NOTES

DISPLAY OF THE GREENFINCH.

IT appears from the *Handbook of British Birds* that no display other than the song-flight has been recorded for the Greenfinch (*Chloris ch. chloris*).

On May 2nd, 1941, my attention was drawn to a shrubbery in Staffordshire frequented by Greenfinches by a note which I could not place. It reminded me rather of one of the emotional notes of the Chaffinch, but much louder and more prolonged—a loud, harsh, continuous, rolling note—which does not seem to correspond with any of the notes under the heading “Voice” for the Greenfinch. I found it came from a bird perched about 12 feet up. This bird was facing another, and as I approached bowed to the other, with wings spread slightly drooped and quivering. At the same time the tail was tilted up and spread. This action I saw twice, the second time from a few yards and in a good light, and at the same time the bird uttered the note described. It continued after this in a somewhat crouching position, and uttered the note some half-dozen times. The note lasted for perhaps a second, with a longer interval between each repetition. The second bird remained facing the other in an upright position still and silent, then flew off, followed by the first bird. I infer but cannot assert that the first bird was the cock and the second the hen, but as the sun was shining full on the feathers of the second bird, it is difficult to say that it was duller in colour. The attitude adopted was well calculated to reveal the yellow in the tail.

J. G. BACCHUS.

On April 29th, 1941, I watched a pair of Greenfinches using a form of courtship behaviour which I have not seen recorded for this species. Both birds were perching in the twigs of a damson tree when the hen approached the cock with crouching body and shuffling wings. After some hesitation the cock responded by pecking gently at her closed bill for about half a minute, after which they parted without any attempt at coition. The action resembled the “kissing” of Hawfinches described in the *Handbook*, but the posture of the two birds suggested rather a kind of symbolic feeding. It closely resembled the attitude of two Blue Tits, which I saw on May 2nd feeding on the same coconut, when the lower bird shuffled wings and the upper one twice responded by feeding it with shreds of coconut.

J. A. G. BARNES.

FIRECREST IN MIDDLESEX.

ON April 6th, 1941, I observed a Firecrest (*Regulus i. ignicapillus*) on Stanmore Common. It was with a mixed flock of tits and Lesser Redpolls, and two Tree-Creepers. When I first observed it in flight I was struck by the bright green of the upper-parts and when it settled and I used my field-glasses the white superciliary stripe was very clear. The bird was under observation at close quarters almost continuously for well over an hour. In the field I noted the following characters: bright green upper-parts, white under-parts, white superciliary stripe, black line through the eye, black line above the superciliary stripe, yellowish-orange crest, a suspicion of a black moustache and brown legs. It frequently uttered a shrill "zree-zree-zree-zree" on a slightly ascending scale and, when I had temporarily lost touch with it, I was often able to find it by listening for this note. It also uttered thin little single notes which I could not distinguish from some of those of the tits and Tree-Creepers.

Mr. and Mrs. C. C. Rose and I recorded the first Firecrest for Middlesex at Ruislip on December 31st, 1938 (*London Bird Report*, 1938) and the above appears to be the second record for the county.

R. W. HALE.

OLD RECORD OF TENGMALM'S OWL IN SOMERSET,
AN ERROR.

GOULD in his work *The Birds of Great Britain* (1862-73) records on the authority of Mr. Braikenridge a specimen of Tengmalm's Owl (*Egolius f. funereus*) killed at Winscombe in Somerset in winter, 1859, and Theodore Compton in his book *A Mendip Valley* (1893) refers to this record, adding that a pair were then observed on the side of Winscombe Hill of which one escaped, and that the other was in the collection of Charles Edwards of Wrington. This record has been copied many times and I included it in my list of Somerset birds, 1906, published in the Victoria County History series. The specimen is now in the Taunton Castle Museum labelled as Tengmalm's Owl shot at Winscombe, 1859 and given by C. L. F. Edwards, 1917. The specimen has of late been examined by, among others, Mr. B. W. Tucker and myself, and is undoubtedly a Little Owl (*Athene noctua*). It certainly appears to me of a warmer brown than the western race, and might be referable to *A. n. noctua* from middle Europe, though after 80 years in a case, the colour may have somewhat changed. Anyhow the record is interesting as being before

the extensive introductions of this species. Tengmalm's Owl must, however, now be omitted from the Somerset list of birds.

F. L. BLATHWAYT.

DISPLAY OF THE SPARROW-HAWK.

It appears from the *Handbook of British Birds* that the downward diving and upward shooting form of display of the Sparrow-Hawk (*Accipiter n. nisus*) has only once been recorded, but in Ireland I have observed it on a number of occasions. This display, as I have seen it, has always been done by the female, and generally at a height of two or three hundred feet—but sometimes lower—and at times by two or more birds in company.

On December 3rd, 1940, three females were seen taking part close together and alternately diving, sometimes two at the time. This may have been a mating display, as one or two males were in the wood over which it was being performed, but the males did not take an active part in the display-flight, merely flying low down in the normal manner and occasionally settling on a tree and calling to the females. (This date is probably exceptional as it is more often performed during the breeding-season.)

The flight begins with the female circling over the breeding wood with peculiar slow and deliberate wing-beats until a height of about two hundred feet is reached, then with three or four quick wing-beats to get up speed the bird shoots up at an angle for about twenty or thirty feet followed at once by a headlong dive with closed wings (when done at a low altitude to within a few yards of the tree tops) and immediately shooting upwards again still with closed wings, then the slow wing-beats and circling flight begins once more and the performance is repeated. This varies in the time between dives—the bird may only give three or four wing-beats before the next downward plunge and thus get in eight or ten dives in as many minutes—or it may fly round quite a bit before the next dive.

This may be done a dozen or more times until finally the bird in one of its headlong dives flattens out at tree-top level and comes to rest in a tree.

Sometimes the performance is repeated in half an hour or so. While all this is in progress the male bird may be heard repeatedly calling from a tree in vicinity.

This display is generally enacted between the hours of 8 a.m. and noon, and most often on bright sunny days with little or no wind.

J. E. FLYNN.

SPOONBILLS WINTERING IN CORNWALL.

FOR the third successive time Spoonbills (*Platalea leucorodia*) have spent the winter on the Fal Estuary, Cornwall. As previously reported (*antea*, Vol. XXXII, p. 370 ; Vol. XXXIII, p. 29, and Vol. XXXIV, p. 67) four were first noticed in October, 1938. Three were present in mid-April, 1939, and one on April 29th. Of the four which came in October, 1939, two at least had arrived by 12th. Only one was seen from January to April, 1940.

During the last winter the estuary was little visited ; four birds, however, were seen in late November, 1940, and mid-January, 1941 ; on April 7th, 1941, only two were present.

P. I. R. MACLAREN.

PINK-FOOTED GOOSE IN CO. DUBLIN.

ON January 23rd, 1941, Mr. T. L. Cobbe obtained two adult Pink-footed Geese (*Anser f. brachyrhynchus*) on Rogerstown estuary, Co. Dublin. The skin of one of these is now in the National Museum, Dublin. Mr. Cobbe informs me that the two birds were shot by him from a party of four which he came on at dusk in the evening, when on the look out for Grey Lag.

Particulars of eight occurrences of this species are given in my *List of Irish Birds*. Since then a further six occurrences are recorded from Ireland including the present one, which is the first for Co. Dublin.

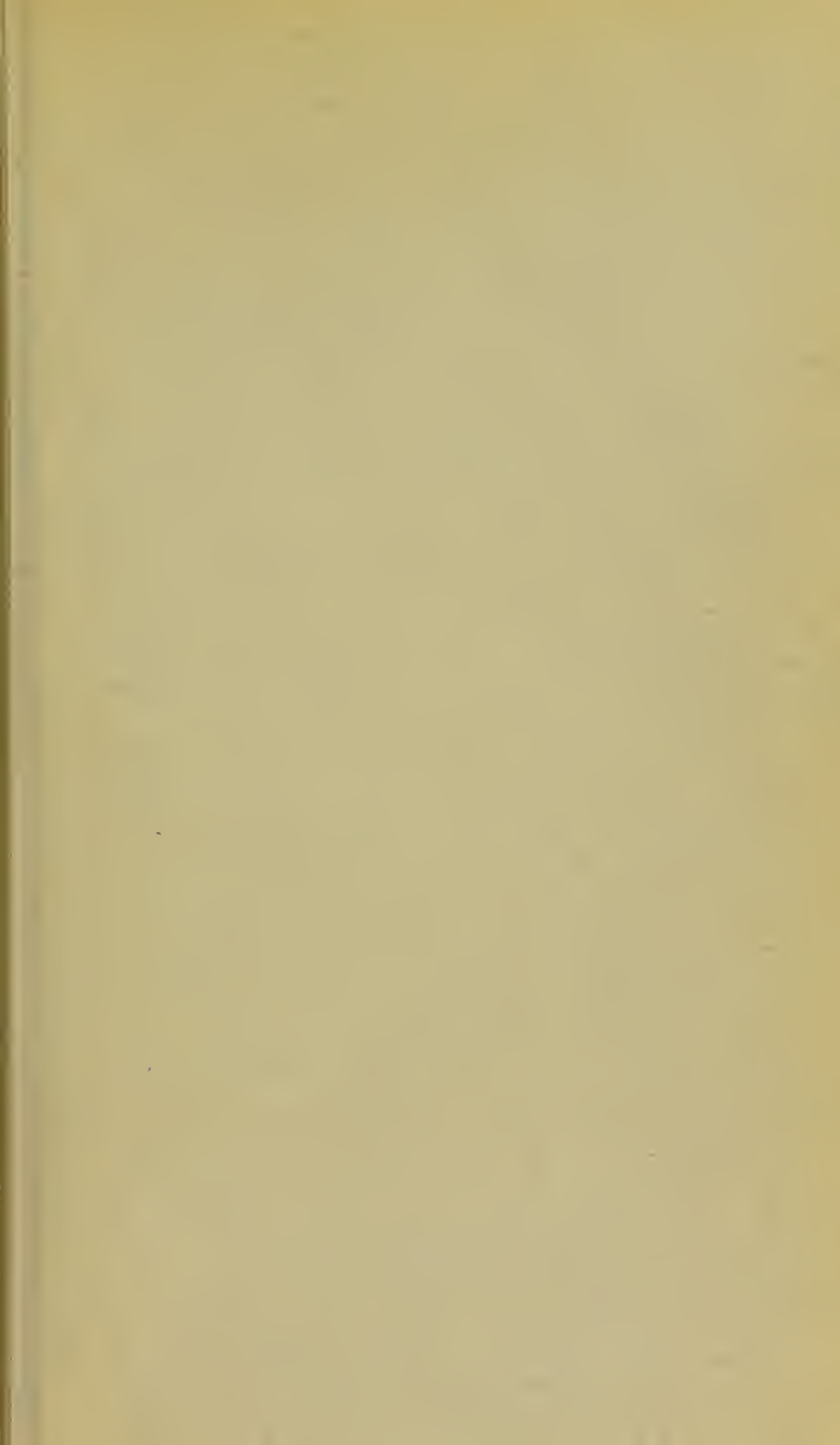
G. R. HUMPHREYS.

WINTER DISTRIBUTION OF GADWALL IN IRELAND.—Mr. G. R. Humphreys informs us that since the publication of his *List of Irish Birds* (1937), he has received particulars of Gadwall (*Anas strepera*) obtained during the shooting season in the counties of Kilkenny, Carlow and Longford, so that now the bird has been recorded from every county in Ireland.

GLAUCOUS GULL IN CORNWALL.—Mr. W. R. Taylor writes at the end of March, 1941, that an immature Glaucous Gull (*Larus hyperboreus*) had frequented the beach at Bude, Cornwall, for some time, being first seen on March 5th. The bird was compared with Great and Lesser Black-backed Gulls standing near and was seen to be approximately equal to the former in size. It was also noted that the wing-tips did not project beyond the tail.

7 JUN 1941

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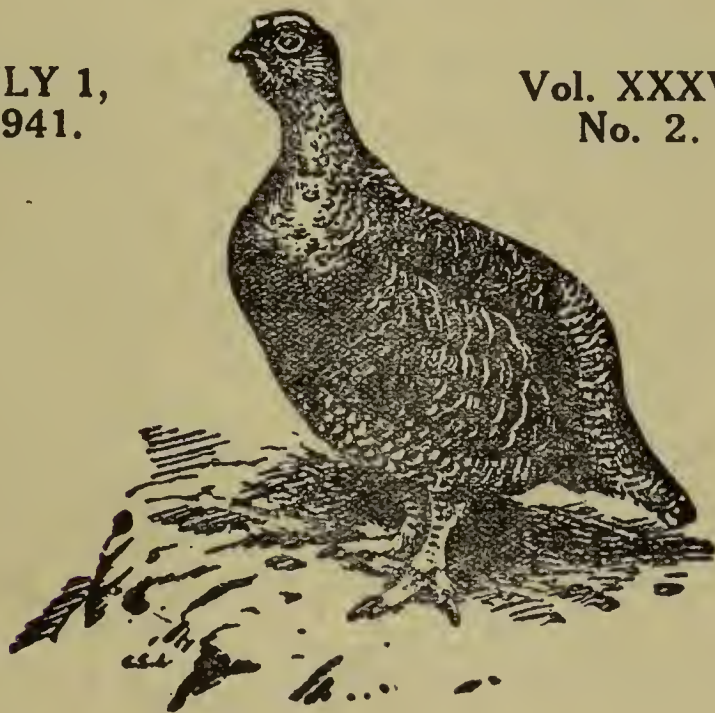
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THE DIVING HABITS OF DUCKS AND GREBES

BY

GEOFFREY C. S. INGRAM, M.B.O.U.

AND

MAJOR H. MORREY SALMON, M.C., M.B.O.U.

WITH

COMMENTS AND ADDITIONAL NOTES

BY

J. M. DEWAR, M.D.

WHENEVER an opportunity has occurred during the last few years we have timed the dives of two or more species of diving birds feeding together at the same place and working at the same depths at Lisvane Reservoir, near Cardiff. Comparing the results thus obtained it is apparent that differences in the duration of the dive exist between various species, slight in some cases but considerable in others.

The marked differences between ducks and grebes, and the Coot are too well known to need any comment except to refer those who may be interested to Dr. J. M. Dewar's work, *The Bird as a Diver* and our own notes which appeared in this magazine (Vol. xxix, p. 38).

SUMMARY OF RECORDS.

<i>Date.</i>	<i>Species.</i>	<i>Depth.</i>	<i>No. of Dives.</i>	<i>Max. Secs.</i>	<i>Mean. Secs.</i>	<i>Min. Secs.</i>
Dec. 22nd, 1934	Long-tailed Duck	5-6 ft.	22	37	30.4	21
	(<i>Clangula hyemalis</i>)					
	Goldeneye	"	11	19	15.8	9
	(<i>Bucephala clangula</i>)					
	Tufted Duck	"	13	18	15.7	12
	(<i>Aythya fuligula</i>)					
Dec. 27th, 1936	Red-breasted Merganser	10-11 ft.	14	26	21.9	18
	(<i>Mergus serrator</i>)					
	Tufted Duck	"	10	25	22.4	20
Feb. 19th, 1939	Red-breasted Merganser	"	8	27	23	15
	Goldeneye	"	8	25	23	17
	Common Pochard	"	6	25	24	23
	(<i>Aythya ferina</i>)					
Feb. 25th, 1940	Smew	11-12 ft.	31	26	20.2	16
	(<i>Mergus albellus</i>)					
	Tufted Duck	"	17	28	24.9	21
	Goldeneye	"	12	34	30	27
Dec. 23rd, 1928	Common Pochard	12-13 ft.	18	32	28.6	25
	Tufted Duck	"	4	34	30.7	29

It is not our intention to draw any definite conclusions based on the above or on the individual records which follow, nor to attempt to reconcile the various averages with Dr. Dewar's 20-10 seconds rule. Dr. Dewar in his latest valuable contribution to the literature of this subject (*antea*, Vol. xxxiii, p. 58) has produced evidence that his rule can be modified by special circumstances and demonstrates that the presence of dense weed has the effect of prolonging the time taken by a bird to reach the bottom and in rising again to the surface. He maintains, however, that bottom-time is not affected but remains more or less the same in all cases. But once it is admitted that certain known factors can cause a variation amounting to from 30 to 40 per cent. between the 20-10 seconds rule and the observed times, there appears to us to be no reason why other, as yet speculative factors, may not have a similar effect, not only on the actual dive-time but on bottom-time as well. The variations in our records cannot be accounted for by the presence of weed, for there was none, and if there had been it would have had an equal effect upon all birds diving together in that area.

Speculation does not carry us very much farther towards a reasonable explanation but we think our records prove that, apart from the presence of dense weed, some other as yet unknown factor governs the length of the dive in some cases.

The following are various notes on individual species, some of which have a direct bearing upon the above. *The Handbook* referred to is, of course, *The Handbook of British Birds*.

COMMON POCHARD (*Aythya ferina*).—The series of 18 dives referred to in *The Handbook* contained one dive of 32 seconds and six of 30. In our experience this species feeds less frequently during the day than the other diving-ducks and so has offered fewer opportunities for observation.

GOLDENEYE (*Bucephala clangula*).—Altogether we have timed 171 dives by this species in water ranging from 6 to 14 feet in depth, the favourite depths apparently being from 8 to 10 feet. The maximum dive was 39 seconds, once only, and there were also four of 37 seconds, the average of the 171 being 26 seconds. By the 20-10 second rule this works out to a depth of 9.6 feet, in close agreement with our observation above as to favourite depths. On November 1st, 1931, we watched three birds in very shallow water just bobbing under and reappearing almost immediately with small fish, evidently from a shoal swimming just below them.

LONG-TAILED DUCK (*Clangula hyemalis*).

SUMMARY OF RECORDS.

Depth.	Number of Dives timed.	Max.	Mean.	Min.
4-5 feet.	4	30 secs.	26 secs.	22 secs.
5-6 "	22	37 "	30.4 "	21 "
8-9 "	11	40 "	38.1 "	36 "
9-10 "	55	48 "	40.2 "	33 "
26-28 "	12	61 "	56.3 "	53 "

It is evident from our records that an immature male timed during November and December, 1934, had a dive-time in relation to depths of up to 9-10 feet at least, which was nearly 100 per cent. longer than that of other species of ducks we have timed. On the other hand on November 25th, 1928, we timed 12 dives by an adult female diving to a depth of 26-28 feet and her average was 56.3 seconds, which is almost exactly the time arrived at by the 20-10 second rule (*antea*, Vol. xxii, p. 264). We suggest that a species that can remain under for such a high average time—when it is probably reaching the limit of its endurance—is quite likely to extend its bottom-time at lesser depths if food is scarce and has to be searched for. We think that this suggestion is supported by the diving of the bird we timed in 1934.

RED-BREASTED MERGANSER (*Mergus serrator*).—Our observations as to depths favoured and the length of the dive, agree closely with those published in *The Handbook*. It is interesting to note that the dive-time average is also near that of the Ferruginous Duck (*Aythya n. nyroca*), 24 seconds (*antea*, Vol. xxxiii, p. 278), and of Common Pochard, Tufted Duck and Goldeneye diving in the same depths (10-11 feet). An adult female we timed on February 19th, 1939, was catching fish and was twice seen to bring one to the surface, the first after a dive of 15 seconds and the other after one of 26 seconds. The difference between these dives could be accounted for by presuming that in the first case the fish captured was swimming pelagically, and in the second had to be searched for on or near the bottom. An interesting point is that after each of the 8 consecutive dives timed, and in fact, as long as we continued to watch this bird, it emerged on the surface within an inch or two of the spot where it dived, after the manner of the Coot (*Fulica a. atra*).

SMEW (*Mergus albellus*).

SUMMARY OF RECORDS.

Depth.	No. of Dives timed.	Max.	Mean.	Min.
10-11 feet.	7	19 secs.	17.4 secs.	15 secs.
11-12 "	47	26 "	20.2 "	18 "
12-13 "	5	30 "	24.8 "	20 "

Unlike the Merganser mentioned above, the Smews we have watched have dived on a long slant, emerging at some distance from the point of entry. The statement in *The Handbook* that the dive "rarely exceeds 15 seconds" is not borne out by our observations. In addition to the records above, we timed a Smew in company with a Red-breasted Merganser, diving together to an unascertained depth. Five simultaneous dives were timed, the Merganser's maximum being 42 seconds, mean 32 seconds, and minimum 26 seconds, while the Smew's were maximum 30 seconds, mean 28.4 seconds, and minimum 25 seconds. Out of a total of 64 dives timed, the minimum was 15 seconds and that time was only recorded once. We should say, judging from some years experience, that 20 seconds is about the average. It will be noted that dive-time in relation to depth is considerably shorter in this species than in other ducks, which rather suggests that the Smew rarely goes to the bottom in its search for food. We have watched them bringing fish to the surface on very many occasions.

GREBES.—We do not think that any of the grebes we have timed, with the possible exception of the Black-necked (*Podiceps n. nigricollis*) were diving to the bottom; in fact, we are certain that the remaining species were diving pelagically.

GREAT CRESTED GREBE (*Podiceps c. cristatus*).—Diving pelagically; 21 dives timed, maximum 45 seconds, mean 23.5 seconds, minimum 11 seconds. The average is a little below that given in *The Handbook*.

RED-NECKED GREBE (*Podiceps g. griseigena*).—Diving pelagically; 10 dives timed, maximum 27 seconds, mean 20 seconds, minimum 12 seconds. No figures for the dive of this species are given in *The Handbook*. Although the number of dives timed is small, they were secured on two separate days when the bird was genuinely feeding. Dives made by a bird that is suspicious and trying to put as great a distance as possible between itself and the object of its suspicion, are apt to be considerably longer than when it is feeding naturally.

SLAVONIAN GREBE (*Podiceps auritus*).—Diving pelagically; 14 dives timed, maximum 31 seconds, mean 22.4 seconds, minimum 15 seconds. We should say that this species has a definitely lower average dive-time than the Great Crested.

BLACK-NECKED GREBE (*Podiceps n. nigricollis*).—Depth 15-17 feet; 38 dives timed, maximum 40 seconds, mean

32.2 seconds, minimum 15 seconds. It is almost certain that the birds (two different individuals) were going to the bottom, as no fish were brought to the surface. Possibly this species feeds more on bottom food than the other grebes we have timed, otherwise it is strange that the smallest of the four species should have the longest dive-time average. We have evidence, however, that fish are by no means an uncommon item of food. On March 19th, 1922, we saw one diving on Llanishen Reservoir and during the 15 minutes we watched, it twice rose with a fairly large fish in its bill which was not disposed of without considerable trouble in killing and swallowing. Again on February 24th, 1924, two birds were under observation for over 20 minutes at the same place. A number of fish were caught and brought to the surface, the successful fisher being constantly worried by its companion diving and coming up alongside and trying to snatch the fish. On September 22nd, 1935, one was seen feeding with some six or eight Little Grebes (*Podiceps r. ruficollis*). It had almost completely acquired its full winter plumage at that date. We timed some of its dives which ranged from 20 to 25 seconds while the Little Grebes' were only 13 to 15 seconds. On several occasions this bird was obviously chasing the Little Grebes while submerged, for one would literally shoot up from below and scutter off over the water, the Black-necked emerging close on its tail in hot pursuit. One Little Grebe so chased definitely had a fish in its bill, evidently the object of attraction.

Besides its usual methods of feeding by diving or picking up food from the surface of the water, we saw one on February 5th, 1922, pottering about in shallow water at the edge of Llanishen Reservoir with its head and neck submerged. It continued to feed like this for well over 20 minutes, the first and only time we have seen a grebe of any species feeding in this manner.

In conclusion we should like to make it quite clear that all the records we have given were made over a number of years on fresh water, and during the season that lies between mid-November and mid-March.

COMMENTS AND ADDITIONAL NOTES.

by J. M. DEWAR, M.D.

Messrs. Ingram and Salmon kindly allowed me to see the manuscript of the above paper. For several years I have followed the work of these ornithologists on diving birds

with greatest interest, and through their generosity have, from time to time, been made aware of their methods and results in greater detail than is possible in printed papers. In the course of years they have carried through a great deal of laborious and careful work on divers and for long enough I have been completely satisfied with the accuracy of their observations. Messrs. Ingram and Salmon have taken a different line from my own in seeking exceptions to the 20-10 seconds rule rather than concentrating, as I have done, on finding confirmation of the rule. But in so doing they have never lost their characteristic sense of fairness and whenever a record appeared to agree with the rule they have admitted as much at once. To seek exceptions to a rule is a perfectly legitimate pursuit. It cannot be expected that highly organized animals like birds should always behave as perfect automatons, and the more exceptions to the rule that are discovered the greater must be the evidence of plasticity of behaviour. Further, from the bird-watcher's point of view the knowledge that exceptions occur and that they may even be numerous ought enormously to widen interest in the habits of diving birds.

In the first "summary of records," if the Long-tailed Duck is excluded, the series shows uniformly minus differences from the 20-10 seconds rule, ranging from 1.3 per cent. (12-13 feet) to 39 per cent. (10-11 feet). Minus differences suggest a factor common to all the birds, namely pelagic diving, and not necessarily the presence of specific differences in diving times.

GOLDENEYE.—The favourite depth agrees well with mine (6-12 feet) and there is also close agreement in the longest dives (39-36 seconds).

The second "summary of records" (Long-tailed Duck) shows uniformly plus differences from the rule, and with the exception of the greatest depth the differences from the rule are fairly even—48 per cent. in 4-5 feet, 60 in 5-6 feet, 59 in 8-9 feet, 55 in 9-10 feet. At present I may not comment on these figures as I have not yet been able to get any timings of the Long-tailed Duck.

In both "summaries" it will be noticed that the times increase with depth though admittedly not in a uniform manner. This increase with depth (it was noted by Gätke and Brock long ago) is the crucial problem of the diving habit. The comparative regularity of the increase with depth is not quite explained by Messrs. Ingram and Salmon's sugges-

tion that the maximum period of immersion of which the bird is capable is available for use at any depth especially when food is scarce. A gradual increase of time with depth appears to be universal in birds and nothing like it is found in mammals, with the possible exception of the *Platypus* of Australia, so far as my own observations and records in the literature show.

RED-BREASTED MERGANSER.—The 15 and 26 second dives can also be explained as (1) a shortest time to bottom (no bottom-time), and (2) a normal dive with bottom-time. The difference of 11 seconds (=duration of hypothetical bottom-time) favours my explanation, but there is no real reason to reject Messrs. Ingram and Salmon's hypothesis of successive pelagic and bottom-dives.

The return of this species to the same "spot in space" on the surface after each dive is, I think, a new observation. The Pochard has this uncanny power very well developed. In the Scottish Zoological Park an individual of this species which returns regularly to the spot in space was seen to make excursions over the bottom during each dive so that the dives are not mere down-and-ups like those of the Coot.

SMEW.—*The Handbook* 15 seconds is certainly too short as a maximum rarely exceeded. My longest is 24 seconds. Messrs. Ingram and Salmon's figures suggest pelagic diving. Twenty dives in 2 feet of water (unpubl.) averaged 11.2 seconds, which is 9 per cent. below expectation.

BLACK-NECKED GREBE.—It seems to be agreed that this species is not a great fish-eater, but lives mostly on bottom-dwelling insects. I have timed (unpubl.) 14 dives in 4 feet = 16 seconds and 5 dives in 8.5 feet = 24 seconds. Until more series are timed it remains open whether the birds timed by Messrs. Ingram and Salmon were actually reaching bottom. Their figures of 40-32.2.-15 seconds show a very unequal scatter of the individual times which means that the average (32.2) will have too high a probable error to be immediately accepted as the correct time for a depth of 15-17 feet.

There is much in Messrs. Ingram and Salmon's papers on the diving habit that is incapable of explanation in the present state of knowledge. Solutions to these problems will undoubtedly come, and there is no better method of study than that followed by the Cardiff ornithologists in trying to correlate diving times with depth of water, nature and relative abundance of the food-organisms, and other local conditions.

INTELLIGENCE TESTS WITH TITS.

BY

M. BROOKS-KING.

WITH the idea of testing the ability of birds to solve problems, I carried out some experiments in February, 1941, which seemed to need a definite amount of intelligence for their solution. My subjects were a pair of Blue Tits (*Parus c. obscurus*), and a pair of Great Tits (*P. m. newtoni*), just ordinary wild birds, inhabiting the garden of the house where I was living. My tests consisted in placing food in a position where it could not be obtained without solving a problem. In their search for their natural food the Tits no doubt come up against difficulties, such as the extraction of a grub from a crevice in the bark of a tree. The natural reaction is to peck away the obstruction, till the food is reached ; and this, incidentally, is what my birds tried to do at first, in the case of the problems I set them. But the correct solution of the problems needed an action quite foreign to the normal ways of the birds in obtaining their food, so that neither instinct nor memory would come to their aid.

To begin with I hung up some monkey nuts on a wire, and also put some shelled ones in a little wire basket. The speed with which they were found by the birds was remarkable ; in fact, throughout the tests, the quickness of the birds in discovering the nuts, often hardly visible, quite amazed me.

As soon as the birds had become used to expecting a constant supply of food, I adopted two new methods of feeding. These are shown in the accompanying sketches A and B. Up to now the nuts had been taken away ; but both these feeders made it necessary for the food to be eaten *in situ*. The Tits at once became reconciled to this ; and I then started with my " puzzle boxes."

The first of these was formed from Feeder B. The aperture was bunged, and a receptacle similar to Feeder A was lowered into the cylinder, with a string projecting over the top. The first to arrive was a Blue Tit. Naturally he went straight to the aperture, and seemed much perturbed when he found it blocked. He spent some seconds in trying to pick out the bung ; but finding it beyond his strength, he began searching for another way in, and in doing so, hopped on top, where, of course, he could see the nuts. He made one attempt to reach them, and then pulled the container up by the string, when it was arranged that it jammed, so that he could take his nut at will. The problem had been solved at first attempt ;

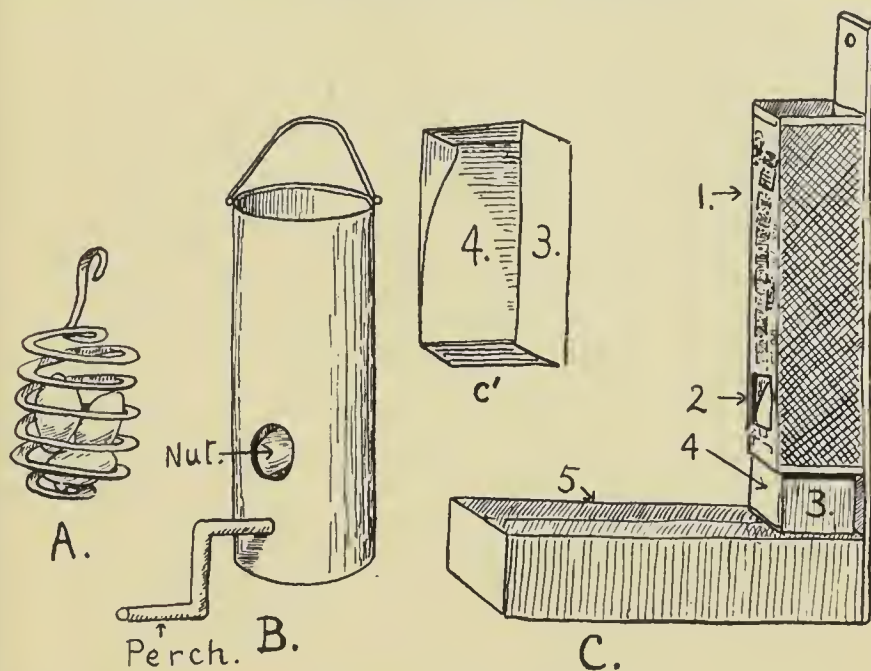
and the whole process had taken less than half a minute. On subsequent occasions both Blue and Great Tits solved this problem, with very few failures, probably due to a new bird arriving for the first time.

The next problem was more difficult, in that the nuts could be seen from all angles, and not only at the position from which they could be reached. For this test receptacle A was slung inside a small wire cage, in the side of which was a small aperture, through which passed a string attached to the receptacle. With the memory of feeding through the bars of Feeder A, the birds tried unsuccessfully to reach the nuts through the cage from several points. In all about a dozen fruitless attempts were made. I then fixed the receptacle in the aperture, in such a way that a slight push would cause it to swing free. The next Tit to arrive found the nuts at once ; but in pecking at them, knocked them out of reach. But he was only puzzled for a moment. Almost at once he pulled the container towards him by the string, only to lose it again, when he let go to peck at the nuts. Again his embarrassment lasted for a few moments only ; then he completed the solution of the problem by putting a foot on the string ! Later on a Blue Tit, probably the same bird, solved the problem completely, the nuts hanging free on his arrival. The Great Tit, which had not been in evidence earlier, also made a complete solution, and at his first attempt.

So far, the solution of the problems had been by means of related actions ; by which I mean that it could be seen that the string was attached to the receptacle, and it needed very little intelligence, though I consider that intelligence was needed, to realize that by pulling the string, the nuts would be brought within reach. What was now required was some apparatus which would test the ability of the birds to profit by an accidental discovery. The apparatus used is shown in sketch C. It consisted of a match-box, with a part of the cover cut away. A piece of card placed inside the box caused the nut within to roll out through the aperture and to fall into the tray below, when the box was partly opened.

It was in connection with this test that the extraordinary observation of the birds was noticed. One is almost tempted to believe that a keen sense of smell was manifested. When the box was closed, the nut was only just visible through the hole in the cover, when looking upward from immediately below. Yet a Blue Tit landed on a wire four feet away, and above the box, and then flew to the match-box feeder, which he had not seen before, and at once began pecking at the

nut through the aperture. After a few abortive attempts he gave it up; and thereafter neither of the Blue Tits had any success with this problem. The cock Great Tit was lucky: in trying to excavate the nut from several points he started pecking at the top of the box, so opening it. Away he went with the nut, to return some five minutes later.



- A. A coil of wire with closed ends, containing nuts.
- B. A wooden cylinder, containing nuts, with an aperture in the side, through which the nuts can be eaten. The top is closed; but is open for the first problem.
- C. Match-Box Feeder (Open).
1. Cover.
 2. Aperture through which nut falls.
 3. Box, opening vertically, when tapped from above.
 4. Sloping card in the box, causing the nut to roll out of the aperture.
 5. Tray (a second box) to catch the nut.
- C 1. View of box, showing the sloping card.

Now his obtaining of the nut was what I call an unrelated action, in that the tapping down of the box was not an obvious method of getting at the food. One might suppose that on his return he would try every method again, and only open the box if by accident he happened to perform the same operation once more. But no. On his second, and on every subsequent visit, he went straight to the top of the box,

and tapped with his beak till he had opened it sufficiently for the nut to be released. This would need several blows ; and he would give a few taps, and then look over into the tray, to see if the nut had dropped ; showing that he understood perfectly the mechanism of the apparatus.

The hen Great Tit never had the luck to find out the trick for herself. She once saw her mate open the box ; but apparently could not learn by example, at any rate at one lesson. She invariably tried to excavate the nut from the front, and eventually wrecked the box.

One other test may be mentioned, though its solution was not so certain. I put out three similar match-box feeders, with a nut in one only. The cock Great Tit made two or three attempts before he found the right one ; but, having done so, never made a mistake afterwards. It happened that the correct box was nearest to the point where he usually perched on his arrival. But he had not gone to this box on the first occasion ; so perhaps this test was also successfully passed.

I may say that all these tests were carried out within two feet of a window, the match-box feeder being actually fixed to the sash run of the window itself. I was thus able to observe the actions of the birds at close quarters.

The question as to how far animals are capable of intelligent reasoning is one on which there are differences of opinion. Personally, after witnessing the actions of these birds during a series of quite difficult tests, I find it hard to reconcile them with the notion that bird behaviour is governed by instinct and memory alone.

REPORT ON THE EFFECT OF THE SEVERE WINTER OF 1939-40 ON BIRD-LIFE IN THE AREA WITHIN 20 MILES OF LONDON.

BY

R. S. R. FITTER.

THIS report is intended to supplement the "Report on the effect of the severe winter of 1939-40 on bird-life in the British Isles" which has already appeared in this journal (*antea*, Vol. xxxiv, pp. 118, 142), and details which were given there, such as those relating to the weather, are, therefore, not repeated. To facilitate comparison, the same section-headings are used as in the previous report. The area covered is that lying within 20 miles of St. Paul's Cathedral, the area of the London Natural History Society.

GENERAL EFFECTS ON BIRDS.

BIRDS FOUND DEAD.

Nine species of birds, mainly the larger ones, were found dead: Chaffinches in and around Bushy Park; Fieldfares and Redwings at Watford; many Blackbirds in Bushy Park and at Westerham; two Herons at Enfield Lock and two in Bushy Park; a Mallard in Richmond Park; a Curlew at Farleigh; many Moorhens and Coots at Gatton Park.

ICING OF PLUMAGE AND FEET.

Only one case of icing was reported, at Bickley, Kent, on January 28th, where a Black-headed Gull was observed to rise with difficulty from the snow-covered ground, owing to a lump of ice as big as a golf-ball dangling from its right foot (R. W. Hale).

UNUSUAL FEEDING HABITS.

As in the cold spell of December, 1938, many unusual birds came to feed in gardens in and around London during the hard weather. They included a Brambling (Leytonstone), Sky-Larks (Leytonstone, Limpsfield, St. John's Wood), a Meadow-Pipit (Hendon), Fieldfares (Carshalton, Wembley), Redwings (Upper Norwood), Black-headed Gulls (Bickley, Richmond, St. John's Wood, Southgate) and Common Gulls (Richmond, St. John's Wood). At Cheshunt Fieldfares and Redwings came to a garden during the cold spell, but would not accept food.

In Richmond Park a Coot was seen eating a dead Mallard frozen into the ice.

Many birds were reported as exhausted or very tame, including Sky-Larks, Fieldfares, Redwings and Black-headed Gulls.

UNUSUAL MOVEMENTS.

The hard weather resulted in many unusual movements of birds into the London area. Siskins were unusually abundant in Bushy Park, where there were about 100 on February 3rd. Bullfinches were driven from a favourite haunt on Hampstead Heath by the cold weather, but returned later. The numbers of Chaffinches roosting in Bushy Park were much reduced during the cold spell, though they were unusually abundant in nearby gardens; over 80 were seen in Regent's Park on January 9th.

As in the cold spell of the previous winter, movements of Sky-Larks took place, though on a smaller scale. The first movement began on January 27th, when nine flocks, amounting to about 150 birds, flew over Woodford from the S.W. That night there was a heavy fall of snow, and on the 28th about 3,000 Larks were counted at Beddington sewage farm, where the previous day there had been no unusual numbers; most of them had left by February 3rd. On the 28th also some Sky-Larks flew over Colindale, and six fed by a rubbish-heap from January 29th to February 8th. On January 29th many Sky-Larks were noted on railway embankments in south London; 15 were feeding on an allotment at Kew; and one very weak bird was seen on the frozen lake in St. James's Park, where three birds were seen on February 1st. On February 1st there were many Sky-Larks along the Thames towpath at Mortlake. On February 2nd one came to a garden in St. John's Wood and a flock of 20 flew over towards Regent's Park, where a flock of 37 was seen on February 6th, gradually diminishing in numbers till only one was left on February 22nd; on February 6th there were two Sky-Larks at Lords. The second movement occurred on February 17th, again coinciding with a heavy fall of snow, when more Larks were seen flying over Woodford, and over 1,500 were counted feeding at Beddington; on the 16th two visited a garden at Limpsfield.

The movements of Fieldfares roughly corresponded with those of Sky-Larks. At Colindale they came with the snow on January 17th and stayed till March 10th; at Beddington sewage farm they were very plentiful on January 28th-29th; in Regent's Park there were ten on February 10th and one on February 13th; and flocks passed over St. John's Wood on February 19th and March 3rd. An unusual number of

Blackbirds wintered in Bushy Park. There were no Redwings in Bushy Park during the cold spell, but they returned in larger numbers than usual as soon as it ceased and stayed in force later than usual. Movements were noted over Islington on January 23rd and over Finsbury Circus on February 23rd. A few Redwings appeared in the central parks; nine in Regent's Park on February 10th and three in St. James's Park on February 12th.

The cold weather brought three kinds of geese into the London area (*antea*, Vol. xxxiii, p. 315; xxxiv, p. 143), viz., White-fronted, Bean and Brent, and the freezing over of many of the reservoirs resulted in some thousands of duck resorting to the Thames, especially in the neighbourhood of Chiswick Eyot. Eleven different species were noted, viz., Mallard, Gadwall, Teal, Wigeon, Pochard, Tufted Duck, Scaup, Goldeneye, Goosander, Red-breasted Merganser and Smew. The partly frozen lake in St. James's Park was visited by a Smew in January and a Goosander in February.

Among the waders, movements of Golden Plover, Dunlin and Curlew were reported. Curlews were seen in eight different localities round London during the cold spell, these comprising more than half the sight records of Curlew for January and February in the London area since 1900. Dunlin appeared in three places, including the Thames foreshore near Hammer-smith Bridge; Dunlin inland in winter are a sure sign of hard weather in the London area. A movement of Golden Plover took place in the last three days of December, when a flock passed west over St. John's Wood, and odd birds were seen on the Thames mud at Chiswick Eyot and at Beddington sewage farm.

FERTILITY.

In Bushy Park there were many short sets and infertile eggs among Blackbirds, Song-Thrushes and Hedge-Sparrows. Curiously enough, however, the majority of these were in late April and May, when it might be supposed that the effect of the cold winter would have passed, while on the other hand there were more c/5 than usual among the early nests. A possible explanation is that the cold weather lowered the fertility of the birds to an extent that exhausted them after the first laying.*

EFFECT ON BREEDING STATUS.

Reed-Buntings and Stonechats seemed to return to their breeding haunts on Epsom and Littleworth Commons late and in much reduced numbers.

*In other reports early broods were small or absent and later ones normal (*cf. antea*, Vol. xxxiv, p. 144).—EDS.

House-Sparrows at Fetcham were much reduced in numbers. They never returned after leaving for the fields in the autumn of 1939, and very few were about till the 1940 young appeared.

Tree-Creepers were apparently reduced in numbers in Bushy Park.

The breeding status of Long-tailed Tits in Surrey does not seem to have been affected.

No Dartford Warblers were reported from the locality in Surrey where they usually breed.

A big decrease of Wrens in Richmond Park was attributed to the cold spell.

Big decreases in nesting pairs were reported at the heronries at Burwood Park (16 to 7) and Wanstead Park (13 to 5), and a smaller decrease at Richmond Park (61 to 55), but at Gatton Park numbers were stable (3) and at Walthamstow there was a small increase (45 to 46). There was thus a decrease of 16 per cent. in the breeding population of Herons in the London area, compared with a fall of 25 per cent. in the country as a whole.

LIST OF OBSERVERS.

Thanks are due to the London Natural History Society for the use of its records, and to the following observers whose notes have gone to make up this paper: Messrs. C. B. Ashby, F. J. F. Barrington, Miss B. E. Brown, Messrs. H. J. Burkill, V. R. Garrett, H. Gaster, W. E. Glegg, K. E. Hoy, Mrs. H. M. Rait Kerr, Dr. G. C. Low, Messrs. L. Parmenter, W. D. Park, E. R. Parrinder, W. R. Philipson, J. H. G. Peterken, A. C. G. Poore, J. E. Roberts, J. A. Smeed, A. R. Sumerfield, A. V. Tucker, Miss D. Whitehead, Messrs. I. A. Williams and W. A. Wright. Special thanks are due to Mr. Roberts, who sent in a detailed report on the effect of the cold weather in Bushey Park.

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NOTES

SISKIN NESTING IN ARGYLL.

ON May 18th, 1924, my father and I found the nest of a Siskin (*Carduelis spinus*) at Acharacle, Argyll. It was about twenty feet up on the spreading bough of an exotic fir (species not recorded) in a large garden. When my father climbed to it, both birds came very close to him and he was able to identify them clearly. The nest was built of twigs and moss, lined with wool and hair, with several feathers curling over the cup. There were two eggs on May 18th, and subsequently five were laid.

Although I have not since found a nest in the district, Siskins have many times been seen both at Acharacle and along the north side of Loch Sunart, as far west as Glenborrodale, in spring and summer. I have no records for the winter. The species is not included as breeding in Argyll by the Misses E. V. Baxter and L. J. Rintoul in their *Geographical Distribution and Status of Birds in Scotland*.

BRUCE CAMPBELL.

SONG OF FEMALE CHAFFINCH.

ON April 29th, 1934, a hen Chaffinch (*Fringilla c. gengleri*) pitched on the apex of an annexe outside my bedroom window at Porlock, Somerset, and sang five or six sharp, quick notes in a slightly ascending scale. These resembled the first phrase of the cock Chaffinch's normal song, but did not quite attain to its brilliance. The song suggested call notes strung together, and was much the same as the song of the female Chaffinch described by Lord Grey in *The Charm of Birds* (p. 80).

E. W. HENDY.

[For a previous note on this subject *cf. antea*, Vol. xxxiv, p. 261.—EDS.]

EXCREMENT REMOVAL BY FEMALE ROBIN.

IN connection with the papers on nest-sanitation recently published in *BRITISH BIRDS*, an instance of *fæces* removal away from the nest may be worth recording. In April, 1940, a female Robin (*Erithacus r. melophilus*), nesting in my garden at Shrewsbury, was in the habit of coming to the doorstep to collect mealworms which were provided for her. On several occasions my sister (Miss V. O. Lloyd) noticed that when the bird defæcated on the doorstep she at once picked up the excrement in her beak and carried it off, to drop it some distance away. The action occurred during a

few days only, while the bird was feeding young in the nest ; both before and after this period she made no attempt to remove her own fæces. This appears to be an example of what the psychologists, I believe, call the "equivalence of stimuli" ; the bird, having been accustomed to perform a certain action in a certain set of circumstances (removal of the excrement of the young from the nest), transferred the action to other circumstances perhaps superficially similar but essentially different (removal of her own excrement from a place some distance from the nest).

L. C. LLOYD.

GREAT SPOTTED WOODPECKER IN WEST HIGHLANDS.

ON August 14th, 1934, what I now believe to have been a Great Spotted Woodpecker (*Dryobates m. anglicus*) flew out over Loch Sunart from woods about three miles west of Salen (Argyll), but it was not until April, 1937, that I satisfactorily identified the bird at Salen. A pair, one very ragged (possibly after a nesting season ?) was seen two miles west, and borings found in a rotten alder four miles west of Salen in July, 1937.

By April, 1938, the call of this species was heard daily round Salen and during the month I had a fine view of one drumming on the metal cap of a post carrying electric power through the scrub woods behind the village.

In April, 1939, my brother flushed a bird from inside a hole which it had bored in a roadside birch near Salen.

Ardnamurchan is a considerable advance to the west on the area marked on the map in Volume II of the *Handbook*, and marks the bird's limit in this direction unless it crosses over to Mull.

On April 19th, 1935, I saw a Great Spotted Woodpecker and found several borings in birch trees in the scrub woods beside the River Oich to the west of Fort Augustus, Inverness-shire.

BRUCE CAMPBELL.

NESTING OF THE GOOSANDER IN NORTHUMBERLAND.

ON April 29th, 1941, in the valley of the River Coquet, some ten miles west of Rothbury, Northumberland, a young farmer found a nest of the Goosander (*Mergus m. merganser*). The nest was in a hollow tree at ground level about 20 yards from the river. When found it contained eight eggs and this number increased to eleven ; but unfortunately the position of the nest became known to other people and all the eggs were taken except two, when the duck deserted and has not

been seen since. The finder states that he had seen a pair of Goosanders in the neighbourhood since the middle of December. This is the first time he has seen Goosanders on the Coquet in the breeding season, though they are fairly regular winter visitors.

An egg and some of the down and feathers from the nest were kindly sent to me by the finder and they prove without a doubt that the identification of the species was correct.

Of recent years Goosanders have been observed to remain in other parts of the county until well into the month of May and breeding has been suspected ; but this is the first recorded instance of a nest having been found. GEORGE W. TEMPERLEY.

EARLY BREEDING OF GREAT CRESTED GREBE IN DERBYSHIRE.

ON May 2nd, 1941, I saw a pair of Great Crested Grebes (*Podiceps c. cristatus*) accompanied by four young ones not more than a few days old, on a pond near Ashbourne (Derbyshire) where one pair now breeds regularly. As the incubation period is some 28 days they must have had eggs at the end of March. The birds do not winter here. They leave in the autumn and return to the pond about the middle of March. This year I saw the first bird (one) on March 13th—rather earlier than usual. It has been a particularly cold and late spring here with constant east winds. KATHLEEN HOLLICK.

GLAUCOUS GULLS IN HAMPSHIRE.

As the Glaucous Gull (*Larus hyperboreus*) is rarely seen along the Hampshire coast, and so far as I am aware all previous records have been for the winter months, it may be of interest to record that on the afternoon of May 24th, 1941, I watched a pair swimming on one of the marshy inlets near Lymington. There were a number of Herring-Gulls in the vicinity, and the large size, very pale grey back and wings, yellow bill and the absence of black in the wings was very noticeable at a distance of not more than 30 yards. The birds appeared to be adults as I could see no dark markings on their tails or bills.

ENID GAYNOR DAVIES.

PARTRIDGE ATTACKING WOUNDED BIRD OF COVEY.

It may be worth recording that a cock Partridge (*Perdix p. perdix*) will attack a wounded bird of its covey. This has twice been witnessed by me in winter time when a Partridge was shot on the ground from among the covey by a sportsman (?) who was probably invisible to the birds.

In each case at the sound of the shot all the survivors of the covey rose, leaving one bird fluttering on the ground. While the remainder flew away one bird settled momentarily at a distance of about 60 yards away and then flew straight back and settled by the struggling bird. It immediately attacked it vigorously by pecking at its head. In both cases the attacking bird was shot and identified as an adult cock.

C. F. TEBBUTT.

HAWFINCH IN ORKNEY.—Commander M. Fogg-Elliott, R.N., records (*Field*, May 10th, 1941, p. 596) that a Hawfinch (*Coccothraustes c. coccothraustes*) was found with a slight wing injury in the garden of Melsetter House, Hoy, Orkney, and was later released. Commander Fogg-Elliott informs us that the bird was found on April 5th, 1941, and remained until the 11th or 12th when it was able to fly normally. The only previous record we have of the species in Orkney was of one caught in Birsay on October 22nd, 1936 (J. G. Marwick *in litt.*).

BLUE-HEADED WAGTAILS IN CORNWALL.—Miss J. M. Ferrier writes that on May 8th, 1941, she watched a party of six Wagtails arrive from over the sea at the Lizard. They alighted on a marshy meadow and allowed examination at close quarters, two pairs were Blue-headed Wagtails (*Motacilla f. flava*) and one pair Yellow Wagtails. They all afterwards flew off inland.

FULMAR PETREL IN SURREY.—Mr. J. R. le B. Tomlin informs us that a *Fulmarus g. glacialis* was found dead in a wood on Whitmoor Common, near Guildford, by Lt. W. P. G. Taylor, on April 20th, 1941.

WOOD-PIGEON COOING WHILE ON THE GROUND.—In connection with Major Rutledge's note (*antea*, Vol. xxxiv, p. 263) Mr. H. Collison informs us that in St. James's Park some years ago he was able to induce a Wood-Pigeon (*Columba p. palumbus*) on the ground to "coo" in response to an imitation of the note.

BLACK TERN IN MONMOUTHSHIRE.—We are informed by Mrs. Constance A. Hare that she and her husband watched a Black Tern (*Chlidonias n. niger*) for a considerable time on April 22nd or 23rd, 1941, near Abergavenny. Mrs. Hare, who has given us satisfactory particulars of identification, states that it was a single bird and was flying to and fro over the River Usk amongst newly arrived Swallows. The species has very seldom been reported from Monmouth.

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ASSISTED BY

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BERNARD W. TUCKER, M.A., F.Z.S., M.B.O.U.

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SOME BREEDING-HABITS OF THE BLACK-WINGED STILT

BY

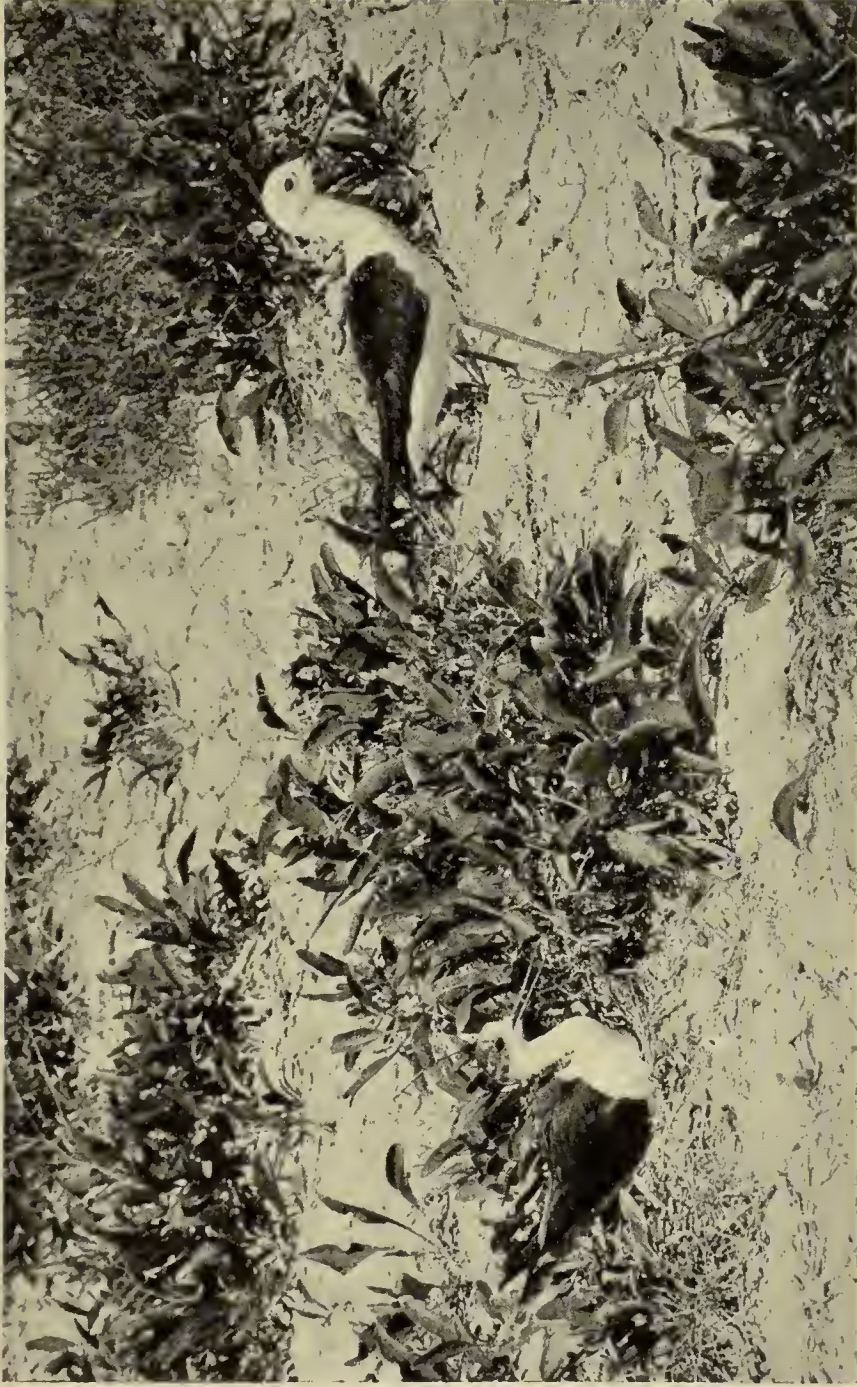
G. K. YEATES, B.A., F.R.P.S., M.B.O.U.

THE following observations on the Black-winged Stilt (*Himantopus h. himantopus*) were made in the Camargue at the end of April and early May, 1937. For many reasons I was unable to observe the full breeding cycle. These notes therefore refer only to the bird's behaviour for the period just prior to laying and for the first week after the eggs were in the nest.

1937 was a dry year in the Rhône-delta, although the water level was by no means so low as in extreme seasons e.g., 1938. It was sufficient, however, to cause desertion of the normal breeding-grounds round Salin de Badon, and it was not until the close of my stay that I discovered a small colony of four pairs of Stilts near Les Grandes Cabanes on the western side of the delta.

When first located, the Stilts spent their time on a small pool of flood water surrounded by extensive areas of dried mud flat from which grew stumpy bushes of *Salicornia*, with occasional clumps of sea lavender and an odd tamarisk dotted about. During this early period, exactly ten days before the clutch was complete, as I later discovered, the Stilts confined their attention to the pool, amongst the many dry tussocks of which I imagined they were preparing to nest. During this time there was strangely little sex-display, and the birds, very noticeably divided into pairs, spent the day in feeding, often wading to considerable depths. Already, however, the territorial instinct was developed, and no invasion of their particular areas was allowed. Human intrusion, even at this stage, was greeted with considerable demonstrative activity, and my early attempts to locate a nest amongst the tussocks were met with more yelping and anxiety than I later found to be the case at the nest itself, although ten days had yet to run before the eggs were laid, and the selected site was in fact at least 200 yards away from the pool on which I began searching. So wholehearted indeed was their anxiety that I felt certain eggs were already laid.

Anxiety was expressed chiefly in flight, both birds of the pair keeping close together in the air. The note is a very insistent and monotonous *kik-kik-kik*, varied in little bursts of two or three, but with short intervals between each. Slight variations, to my ear sounded like *ky-ick* or *ky-ack*. From



BLACK-WINGED STILTS: The male is incubating and panting in the heat: the female is on guard.
(*Photographed by G. K. Yeates.*)

time to time the pair would alight together, and give tongue in the same way on the ground, "bobbing" meanwhile like a Redshank (*Tringa t. totanus*). In this "anxiety flight" considerable use is made of the long legs which are depressed and straightened almost as though part of the effort of mobbing. In normal circumstances I noticed that the legs were carried straight behind the body.

The actual breeding site was something of a surprise, for the two nests found were both placed at least 200 yards from the small and rapidly diminishing pool and well out in the arids. Both nests were built in sea-lavender and had quite well constructed foundations of bents. The dry terrain chosen was in no way forced on the birds, for, although a dry season, there was no shortage of small pools better suited to the text-book conception of a Stilt nesting ground, and indeed, as already mentioned, an ideal site of this type was ready to hand in the little patch of flood water on which the birds were first located. In and amongst the Stilts within a 50 yard circle were breeding also Pratincoles (*Glareola p. pratincola*), Lapwing (*Vanellus vanellus*), Stone-Curlew (*Ædicnemus æ. ædicnemus*) and Ashy-headed Wagtail (*Motacilla f. cinereo-capilla*).

Incubation, which began with the last egg in one nest but on the third egg at the other nest, is the task of both sexes, and the intervals of changing over were most remarkably, almost ridiculously, short. As soon as the coast was clear, both sexes started a positive race to the nest, stalking at full speed through the *Salicornia*. The first to arrive sat with the utmost speed, as though suspicious lest the other should usurp its victory. The loser stood just behind the sitting-bird or walked round it in circles, clearly champing with impatience. I never saw either bird more than fifteen feet off the nest, once one or the other was sitting. After five minutes or so, the bird "on guard" moved up behind the sitter, and with a soft crooning note apparently indicated its desire to incubate. Normally this was enough, and the sitter quietly gave up its place, though never until its mate was standing right over it, as though it was anxious not to expose the eggs for a moment longer than necessary. Once I saw prodding resorted to by the female when the male was recalcitrant and refused to leave the nest. I cannot help feeling such behaviour to be abnormal, but I can find no detailed observations by others on the share of the sexes in Stilts. Perhaps too, the great heat of the baked mud influenced the birds. It was hotter than the hand could tolerate with comfort.



BLACK-WINGED STILTS: The female is about to relieve the male on the nest.
(*Photographed by G. K. Yeates.*)

The process of lowering the body from its long legs on to the eggs was most fascinating to watch at the range of a few feet, and may be worth detailing. On arrival at the nest the head is lowered until the bill touches the eggs, as though the bird was measuring the distance of its descent. Calculations made, the red "stilts" are slowly and gradually bent at the "knee" until the breast very gently makes contact with the eggs. In this position the tail sticks up at an acute angle into the air, then come the wing tips and finally the "knees." From this posture it shuffles on to the eggs, the tail wagging in the process. Then, slowly again, it lowers its extremities until tail and wings fall into their normal place. Thus fixed, the bird levers itself up very slightly, and, its balance gained, finally shuffles on when its red "knees" protrude far behind.

NOTES ON THE SPRING TERRITORY OF THE BLACKBIRD

BY

DAVID LACK AND WILLIAM LIGHT.

INTRODUCTION.

THIS study was made on the Dartington Hall estate, South Devon, in 1940, when the abnormal cold weather in late January and early February made possible the trapping and colour-ringing of an unusually large number of Blackbirds (*Turdus m. merula*). Unfortunately in the following autumn Blackbirds were extremely scarce, and all the colour-ringed birds had disappeared, for which the late summer drought was possibly responsible, while the departure of the senior author on national service in December abruptly terminated the investigation.

This is apparently the first time that the spring territorial behaviour and threat posturing of the Blackbird have been described. In other respects the study is extremely incomplete, and courtship was not studied, but it seems worth pointing out that the breeding behaviour presents several unusual features which would repay detailed investigation.

The Blackbird is a difficult species to study in the country owing to its wildness. One male with a territory in the middle of a wood was so shy that it was rarely observed at all, but those individuals whose territories included areas regularly frequented by human beings were tamer, especially one pair by a well-used road. Visits to Kew Gardens in January, 1941 confirmed that this normally shy species is far easier to study in places where it regularly sees large numbers of unmolested human beings.

NUMBERS TRAPPED.

Between mid-January and the end of February, over an area of some seven acres, 25 male and 13 female Blackbirds were trapped. The figures do not necessarily mean that males are twice as numerous as females in the wintering population, as it is probable that, as with Robins (*Erithacus r. melophilus*), males enter the traps more freely than females. (Lack, 1940). Males are also seen more often than females, but are more conspicuous in behaviour.

Of the 25 ringed males, nine were resident. Indeed all the resident males with territories bordering on the trapping area were ringed. One other male was probably resident farther off, as it was seen occasionally. Another male, ringed

on January 31st, was found dead at Newton Abbott, seven miles to the east, on March 3rd, suggesting that it may have been a winter or hard-weather visitor on return migration. The other 14 males were not seen again, and doubtless included both residents from farther away and winter visitors.

Of the 13 ringed females only one resided in the trapping area, and another had a territory a little way outside. The four other females whose territories bordered on the trapping area escaped ringing, which supports the view that females are less readily trapped than males. None of the other 11 ringed females were seen again. This suggests that a higher proportion of females than males were winter visitors.

Four of the males and one female trapped in 1940 had been ringed in the area in previous winters, but only two of these, both males, were resident in the trapping area. One of these males was first ringed in November 1935, hence was at least in its fifth year.

SIZE OF TERRITORIES.

Blackbirds' territories are much harder to map accurately than those of Robins, as the birds are so much shyer and sing so much less. One breeding pair owned at most $1\frac{1}{2}$ acres of woodland, another pair some 2 acres, a third pair $2-2\frac{1}{2}$ acres, while one unmated male held $1\frac{1}{2}-2$ acres, and another an area of less, probably much less, than one acre, but was too wild to permit accurate determination.

A woodland area which in the springs of 1935 to 1938 held 9, 6, 8 and 7 Robins respectively held 8 resident Blackbirds in late March 1940 (three mated pairs and two unmated males). But whereas the Robins fed almost exclusively in the wood and on the wood edge, much of the Blackbirds' food was derived from the surrounding open fields. Further, unlike the Robins, the Blackbirds owning territories at the wood edge defended a not inconsiderable area of open ground bordering the wood. However, the central parts of the open fields seemed to be neutral ground, since neighbouring males fed here without conflict. When coming out to feed, each Blackbird would at first keep close to the cover of its own territory, only gradually moving out into the open, and at once retreating if alarmed.

TERRITORIAL DEFENCE.

Colquhoun's statement (1940) that Blackbirds lack a strict territorial sense is certainly not true at Dartington. Territory is as definite as it is in the Robin. If one attempts to drive a

Blackbird out of its territory, it usually behaves like a Robin under similar circumstances, flying in front of the observer till it reaches the boundary, then refusing to go farther, and eventually flying back past the observer into the centre of the territory. The Blackbird not infrequently leaves its territory to feed or to mob an owl, and occasionally when suddenly alarmed, also, but not apparently at Dartington, for communal roosting and for the communal display described by Morley (1937) and Lack (1941). But these habits are not inconsistent with well-defined territories.

In February and March, males regularly patrolled their territories, taking short flights with intervals for feeding and perching quietly, and usually the observer was not long in the territory before the male came by on his round, the female often being in attendance.

The owning male at once attacks any other male Blackbird trespassing in the territory, and does not desist till the trespasser leaves. Probably the male also drives out trespassing females, as some violent male-female chases were seen. For instance, the unmated male of one territory pursued the trespassing female of the next territory back into her own territory, at which he was himself chased back by her mate. (The possibility that some of such male-female chases are sexual is not excluded.) But females were not attacked nearly so often as trespassing males, and sometimes were apparently ignored.

We only once saw a female attack a male, though on several occasions a trespassing male fed in full view of the owning female. We also saw only one fight between two females. Morley (1937) notes that the owning female chases out trespassing females; Coward (1939) also describes fights between females. But, contrary to Morley's view, which is also stated by other observers, we found that the females certainly take much less part than males in the defence of the spring territory. (It is usually a female, not a male, which starts the attack on an owl, but this is a quite different pattern of behaviour from territorial fighting).

THREAT-DISPLAY.

As with other territorial species, most encounters between males are settled by threat-display. We saw this only between males, not with females. On seeing an intruding male, the owning male flies towards it and, if the intruder flies off, pursues it out of the territory. But if the intruder stays put, the male does not usually attack at once, but perches some

feet away and, with lowered and retracted head, approaches gradually and indirectly in a series of hops, runs or very short flights. This occurs both on the ground and in the trees. In the latter case the attacker often approaches in a succession of hops and short flights in spirals round the trunk. By the time that the attacker is within a few inches, the intruder usually departs. On three occasions when the intruder did not retreat, the attacking male repeatedly snapped its beak open and closed. The bright orange-yellow of the beak and the inside of the mouth, and also of the eyelid, are then in contrast with the black plumage, and can perhaps be regarded as threat-colours. Except for this, the attacking male does not usually posture. But on two occasions, the wings were flicked open and closed and the body jerked. Nearly always the bird keeps silent, but occasionally gives a sibilant "seep" note and on one occasion faint "chucking" accompanied the beak-opening. Comparatively rarely does the intruder wait to be attacked, but this was seen occasionally.

Threat-display is also common between two resident males along the common boundary of their territories, and is usually remarkably formalised and unexcited. When one male sees the neighbouring male by the boundary, it flies up, settles a few feet away and then hops or runs towards it with lowered head. As it approaches, the other male usually turns and hops or runs unhurriedly back into its own territory, followed by the first male. After a few yards, the retreating male turns and hops or runs towards the approaching male, which now turns and retreats leisurely back into its own territory, followed by the other. This procedure may be repeated a number of times. Usually there is no posturing save for the lowered head, but there is greater excitement if one male penetrates too far into the other's territory. The performance occurs both in the trees, the males hopping from branch to branch, and also on the ground, where the measured hopping or running of the two birds looks particularly pointless.

Of course territorial encounters are occasionally more serious, and there are records of one male killing another. The late Eliot Howard informed us that he found one male Blackbird dying after a fight with another. But, as with the Robin, serious fights are rare, and probably occur chiefly when one male is trying to dispossess another of its territory.

BEHAVIOUR TOWARDS STUFFED SPECIMENS.

A stuffed male and stuffed female Blackbird were twice placed in prominent positions in one territory in March, and

later near the nests of three different pairs. In some cases male or female seemed curious, but no attempts were made either to attack or to court the specimens, which were soon ignored.

PAIR-FORMATION.

One pair had formed before February 13th, another before the end of February, but how long before is not known. The great scarcity of Blackbirds in autumn prevented further work on the time of pair-formation. But a male was seen following after a female on December 3rd. Also, in a garden at Horsham, Sussex, on December 25th, 1940, two Blackbird pairs were already definitely formed, and at Kew on January 13th, 1941, many pairs had already been formed, and territorial encounters were seen. Coward (1939) considers that pair-formation occurs in October and November; he gives no details, but doubtless had more data than he published. The manner of pair-formation and the first staking out of the territories would well repay investigation.

Morley (1937) and Lack (1941) describe remarkable communal display among Blackbirds from early spring to April. Coward's mention (*loc. cit.*) of six males fighting for one female perhaps refers to the same phenomenon. Since Blackbirds pair up before midwinter, the relation of these communal gatherings to pair-formation needs further study. Despite careful watch, no such gatherings were seen at Dartington. D. Lack saw such a communal display near Richmond, Surrey, in February 1941, and this without special watch being kept. A good performance is conspicuous. Perhaps they are a local phenomenon.

The shyness of the birds, and the fact that only one resident female was ringed, made it difficult to determine accurately the proportion of mated to unmated males at Dartington. At the end of March, of seven males, five were definitely mated and two definitely unmated. It is not known if the latter obtained mates later in the season.

SONG.

Like Colquhoun (1940), we found that a few males sang fairly frequently, a few were never heard to sing at all, most sang occasionally and quite sporadically. Song was definitely rather more frequent from unmated than mated males, but even unmated males sang very irregularly. Blackbirds started singing in the fourth week of February, but little song was heard till near the end of March, with an increase in April.

(1940 was a late spring. In 1941 one male was singing in late January).

The two functions usually attributed to song are advertisement (*a*) of territory, (*b*) of an unmated male. Round Dartington most male Blackbirds have staked out territories and possessed mates for several weeks, and, if Coward is correct, several months, before they start to sing. Hence, though unmated males sing somewhat more than mated ones, song would seem to have little or no survival value to the species at the present time, which is particularly curious in view of the beauty of the song. But, as compared with typical song-birds, the Blackbird has a relatively small territory for its size, and is visually conspicuous, while pair-formation appears to have been pushed back to the autumn. As Colquhoun points out, the song has relatively poor carrying power compared with that of other *Turdus* spp. Observations would be of interest on the continent of Europe in places where the bird is, at least partially, a summer visitor and presumably stakes out territory and forms into pairs after arrival in spring.

MOBBING BEHAVIOUR.

When Blackbirds discover a Tawny Owl (*Strix aluco*) they gather round with loud calls. In the cases we observed, such gatherings were started by the resident female of the territory giving a characteristic "quick quick" call, which was promptly taken up by neighbouring Blackbirds of both sexes, the call of the males being not so loud as that of the females. If the original female continued to call, neighbouring Blackbirds of both sexes would fly to the spot. Territorial boundaries are forgotten, and males perch close together and if the Owl takes wing, fly on after it together. Similarly the otherwise rigidly territorial males of the Red Bishop-Bird (*Euplectes hordeacea*) left their territories to join in mobbing a Coucal (*Centropus superciliosus* (Lack (1935).)

At at least half such gatherings, we did not find an Owl. In one case we suspected a rat, but many others were definitely false alarms.

OTHER LOCALITIES.

Casual observations at Kew and near Richmond, Surrey, in the early spring of 1941 suggest that territorial and other behaviour may be rather different in areas where the bird is densely distributed from that observed at Dartington. Further study is desirable.

SUMMARY.

1. Breeding pairs of Blackbirds own sharply defined territories some two acres in size.
2. Defence is mainly by the male and threat-display is described. The orange-yellow beak, inside of mouth and eyelid may be used as threat colours.
3. Pair-formation apparently occurs before mid-winter but needs further study.
4. Song is irregular and, apparently, almost functionless.

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DISPLAY IN BLACKBIRDS

BY

H. LAMBERT LACK.

COMMUNAL display in Blackbirds (*Turdus m. merula*) has been so rarely observed or recorded that a brief description of a display I had the good fortune to witness this spring may prove of interest. Chancing to look out from the window of a house in a Sussex garden soon after dawn on February 10th my attention was arrested by the strange behaviour of a group of Blackbirds on the lawn. The whole group seemed in a state of excited commotion. Their attitudes and activities forcibly reminded me of the display of Blackcock on a lek. (I have never actually watched a Blackcock display but have several times studied its details on first-class films).

This first display was seen about 7.15 a.m. and lasted until 7.55 a.m. (G.M.T.) with one interruption of some ten minutes, probably caused by cats. At first four, later six cock Blackbirds were congregated on a small area of the lawn: one, sometimes two, females were seen feeding some twenty or more yards away from the group. Only the males took part in the display. With wings drooping and slightly extended so that their tips were visible, with tail spread and depressed almost to the ground, head, neck and beak fully extended and the neck-feathers fluffed out, one bird would rush rapidly at another and chase it, or run round and round it at a distance of about 15 inches. Sometimes two birds would circle round each other or round a third bird, or all three would be running in circles. Or again two birds would run straight side by side and some twelve to fifteen inches apart for a distance of three or four yards, then switch round and run back again; often two birds in a similar fashion would chase a third, one on each side of it. On rare occasions these chasings ended in a brief aerial combat, two birds flying up at each other to a height of two or three feet in the air and apparently attacking with beak, claws and wings. The fights lasted but a second or two and though apparently fierce no damage seemed to result. It was particularly noted that in the chasings the birds always *ran* with very rapid steps, they never hopped: that their beaks remained closed and that they uttered no sounds. Those birds which for the moment were not actively engaged in these performances stood motionless with wings and tail spread and depressed and with feathers fluffed out as above described, but with the head, neck and beak stretched upwards and forwards at an angle of about 45 degrees giving

them a curiously malevolent expression. This first-seen display was so spectacular that it excited the curiosity of two other people who took little or no interest in bird behaviour.

Consequent on this observation regular watching was instituted from early dawn for about an hour, and later on in the evening from early dusk to dark. The morning displays continued until April but were very irregular. On many days there was no display, on frequent occasions two, three or five birds only were present at a time and indulged in mild pursuits and rarely aerial combats, activities which might not have attracted much attention unless they had been watched for; on only a few days really active displays occurred. On some occasions two or more females appeared on the scene and might chase each other or chase or be chased by single male birds.

The first evening display was noted on February 21st about 5.40 p.m. (G.M.T.). Four cocks and three hens were seen on the lawn and for a brief time, until disturbed, the males actively displayed. The following evening from 5.30 to 6.0 p.m. five to eight cocks at a time and one female intermittently assembled on the lawn: they were mostly feeding but it seemed that when two birds approached each other closely posturing and chasing at once occurred. On March 7th there was a similar evening display. On March 8th, a mild sunny day though with a cold wind, display was noted on and off all day but especially between 7.30 and 9.30 a.m., around 11.30, and again at 6.30 p.m. Similarly on the following day, also bright and warm, three or four cocks were usually present and chasings were frequent. Later on displays became less frequent but they were well-marked in the early mornings of March 26th and 28th: whilst on March 24th and on April 1st mild displaying occurred on and off all day. By the end of the first week in April nesting was in full swing and assembling and displaying gradually faded out. A few points may be specially noted.

The *scene of the display* was limited to a narrow neck of close-cut lawn uniting two larger portions, an area roughly 12 to 15 yards wide by 20 yards long. This area was bordered on each side by low evergreen bushes affording excellent cover for the birds and into which the chasings were often continued. Beyond the bushes on one side was the house, on the other a small pond. The area of the whole lawn was well over an acre and some half of this was not overlooked from the house: it is therefore not certain that gatherings never took place

in other parts of it but they were never seen and for various reasons it seems unlikely. It was particularly noted that the display area seemed a favourite feeding ground not only for Blackbirds but as April came on for Thrushes, Robins, Starlings, Chaffinches and Hedge-Sparrows. Also the area may have been a boundary between Blackbird territories as one female apparently belonging to the pond side and another from the house side occasionally chased each other, or were chased back into their respective territories by a male bird. The garden is a large one, some six and a half acres including the house and buildings, and is surrounded by grass fields with rough hedgerows. The local Blackbird population is a dense one, probably eight pairs in the garden and more close by.

The *duration and intensity* of the displays varied much. They were most frequent and vigorous at or soon after dawn, less frequent but occasionally vigorous at dusk. They seemed greatly influenced by weather conditions. In March there were many bright but cold mornings when the lawn was white with frost, on such mornings no birds were seen. On windy days display was rare. Mild mornings, sunny, dull or wet, seemed most favourable: the days on which display continued on and off all day were unusually warm for the season. Whether the displays commenced at an earlier date than February 10th must remain unknown; the late date to which they continued was perhaps due to the unusually cold late spring.

The *meaning or value* of the display is doubtful, the evidence is mostly negative. There was nothing to suggest a courtship display: it was unlike any recorded courtship display (*vide Handbook of British Birds*): the females took no part in it; two males, probably those owning territories nearest the display area were observed to be paired by December 25th. The display showed none of the special characters of territorial disputes (see paper by D. Lack and W. Light): the pursuits were promiscuous: no male seemed to defend any special area of the display ground. I can only hazard a diffident suggestion. It is well known that Blackbirds often feed communally in winter, earlier in the season I had seen an assembly of ten or more males feeding amicably on a small area in a grass field adjoining the garden, and larger assemblies have been reported. It seems conceivable that the display area in this garden was merely a favourite feeding ground where the birds associated amicably until the time when their seasonal pugnacity attained its height, and that these hostile

displays heralded and resulted in the break-up of the communal gatherings. Whatever the explanation it seems rash to assume that such a definite display had no meaning in the present or past life of the species.

LITERATURE.

It is remarkable that there are so few records of these displays, presumably because in their more marked form they are very rare. Miss Averil Morley gives the only account* I have met with. She describes similar gatherings of similar numbers of male birds on similar definite areas, and similar display activities, promiscuous chasings, etc. She does not describe the peculiar postures the birds assume when stationary or even when chasing, and one gathers that the displays she witnessed were less spectacular than that above recorded. She believed also that the female played a larger part in them although she informs me she has since modified this view. She seems equally at a loss as to the meaning of the displays and gives her account the non-committal title of "Some Activities of Resident Blackbirds in Winter." David Lack has also informed me (private letter) that he witnessed a similar display near Richmond, Surrey, in February this year, a most remarkable feature of which was the tameness of the birds. The display ground, a gravel and flower-bed area only some ten yards square, was on the edge of a much-used road, and the birds freely performed with persons walking past some fifteen yards away and in full view. He considers that "the performance is not comparable functionally with that of any known bird."

**British Birds*, 1937, Vol. xxxi, p. 34, also private letter.

NOTES

INTERBREEDING OF HOODED AND CARRION-CROW FOR THIRD TIME IN CO. DUBLIN.

IN 1939, as already recorded in *British Birds*, Vol. xxxiii, p. 194, a male Hooded Crow (*Corvus c. cornix*) and a female Carrion-Crow (*C. c. corone*) nested in Co. Dublin and successfully reared their young.

In 1940, presumably the same pair again nested in the same wood but in a different tree. Two young birds of this brood were often seen after they had left the nest. One was a Hooded Crow in plumage, the other was all black above with grey under-parts. A third young bird was found dead under the nest. It had been dead for some time when found and all the feathers of the under-parts, had disappeared, but the mantle, back and rump were all black.

In 1941, the old nest of 1939 was again used. The female was a Carrion-Crow, apparently the same bird as in the two previous years. But the male Hooded Crow seemed a different bird; it was much more shy in behaviour and less attentive to the female and the young than the male in 1939 and 1940. Three young, all in the plumage of Hoodies, were seen in the nest and often after they had flown. P. G. KENNEDY.

DISPLAY BY CHAFFINCH.

I RECENTLY witnessed a display by a Chaffinch (*Fringilla c. gentleri*), which was new to me and which I have not seen described, so the following notes may be of interest.

The female was feeding in the ditch of a country lane while the male made a semi-circle round her with a radius of 3-4 ft. The head and tail were held horizontal to the body, both twisted to an angle of nearly 45°, inclining in the direction towards which he was moving. When he reached the ditch and turned back, the head and tail were also turned in the reverse direction. The neck-feathers were ruffled, crest slightly erected, and shoulders seemed prominent, though the wings were not held away from the body. The sidling hop was rather ludicrously suggestive of a minuet step.

The female paid no apparent attention, though she gave an occasional single "cheep."

The male repeated the semicircle three times and was then unfortunately interrupted by someone approaching.

WINIFRED M. ROSS.

THREE LONG-TAILED TITS FEEDING ONE BROOD

At the end of April, 1941 in Ashdown Forest, Sussex, I found a nest of Long-tailed Tit (*Ægithalos c. rosaceus*) with young about nine days old. These were being fed by three adults. So far as I could discover there were only eight young in the nest, which was of normal type. All three adults searched for food together within 150 yards of the nest, and returned to its vicinity together and fed the young in turn.

The area covered by the three birds extended over what has in former years been the territory of two pairs, but there was no sign this season of a second pair. J. A. GIBB.

[A similar instance of three adults feeding young in one nest, but in that case a very large brood, was given in Vol. xxix, p. 80, and in a comment upon it the late F. C. R. Jourdain stated that at least five previous records of three birds at one nest had been found and three records of four birds. Other instances have since been reported.—EDS.]

SPOTTED FLYCATCHER BREEDING IN ORKNEY

As I believe the Spotted Flycatcher (*Muscicapa s. striata*) has rarely been recorded as breeding in Orkney it should be recorded that a pair have built a nest and are now (June 23rd, 1941) incubating four eggs, in the garden of Melsetter House, Hoy. M. FOGG ELLIOT.

[The only previous records we know are that the species bred for several years about 1867 and that two pairs nested in 1917.—EDS.]

DIPPER ON BUCKS-HERTS BOUNDARY.

On May 4th, 1941 my wife and I and three friends found a Dipper (*Cinclus c. gularis*) on the River Chess just below Chenies. We watched the bird for some time and saw it again on the 11th, but were unable to find it on the 18th. It appeared to be a single bird and the colouring of the lower part of the breast was the normal chestnut of the British form.

There seem to be very few records of the species, even as wanderers in the counties of Hertford and Buckingham.

RONALD H. RYALL.

GREEN WOODPECKER IN NORTH
NORTHUMBERLAND

On March 25th, 1941, while walking in a fir wood, 10 miles south of Berwick, Northumberland, I was surprised to hear the cry of a Green Woodpecker (*Picus v. pluvius*). I stopped,

and presently the bird flew by and settled on the top of a large beech tree, and through glasses I could recognize it as a Green Woodpecker. After a few minutes, it flew back into the wood, and though I heard its "yaffle" once more, I never saw it again that day, nor on subsequent days.

Though breeding in the south of the county even occasional visitors northwards appear to be very unusual. D. H. JOICEY.

DISPLAY OF THE SPARROW-HAWK.

SINCE reading the account of the dive-display of the Sparrow-Hawk (*Accipiter n. nisus*), by J. E. Flynn (*antea*, p. 19), we have witnessed a similar display. This was on the morning of June 21st and it took place over a steep wooded hillside in Co. Antrim at over 1,100 feet. The bird was a female and was alone. Flying with short, deliberate wing-beats, it climbed a little to gain height and then suddenly went into a steep dive estimated as 70° to the horizontal and fell 200 to 300 ft. before checking itself. After the turn, the momentum gained carried it, still with folded wings, up 50 to 100 ft. in an almost vertical climb. The performance was repeated four times in a very short space of time.

M. N. and D. H. RANKIN.

COMMON POCHARD BREEDING IN N. LANCASHIRE.

ON May 30th, 1941, I saw a female Pochard (*Aythya ferina*) with two very young ducklings on a water in north Lancashire close to the Westmorland border. I watched the duck for some time through a telescope at about 60 yards range, and her grey body, brown head and neck, grey-flecked face and low posture in the water left no doubt of her identity. A drake Pochard which joined her for some minutes provided comparison for size and build. The two young followed the duck closely for twenty minutes and there were no other ducks visible on the same stretch of water, so there could be no question about their species. There were at least two other drake Pochard present, so it is possible that more than one pair nested this year. I believe the Pochard has not previously been recorded as breeding in north Lancashire.

On June 16th, 1941, I saw two male and one female Tufted Duck on the same water, the first I have noted in this district in the breeding season, and three male and one female Wigeon. Seven Wigeon apparently uninjured, spent the whole of the summer of 1939 on this water, but I have no evidence of their breeding there.

J. A. G. BARNES.

BREEDING OF THE FULMAR PETREL IN
CUMBERLAND.

ON May 28th, 1941, while walking along the cliff top of St. Bees Head (north head) we noticed many Fulmar Petrels (*Fulmarus g. glacialis*) gliding to and from the cliff face. From a projecting rock it was found that in all cases where the flying birds came nearest the cliff a bird of the same species was sitting in a cleft or crannie in the cliff face. In all instances the birds were in inaccessible places, except one which was sitting nearer the cliff top than the others. To reach this horizontal cleft in which the bird was sitting the use of ropes was necessary otherwise the descent would have been impossible. It had been hoped that one would be able to get head and shoulders inside the cleft and reach the bird with one's hand; however, in actual practice it proved that one could only get one's hand within three feet of the bird. This was found sufficient to induce it to rise slowly to its feet and walk to the edge of the cleft exposing one large white egg and so proving breeding definitely.

In all ten Fulmars were noted brooding in clefts or on the rock shelves in a similar manner to the one that was investigated. Birds on the wing frequently came in to rest on ledges, but they never stayed for over twenty minutes, while the ten sitting birds were not seen to move from their sites throughout the day. J. F. STIRLING and G. K. ROBINSON.

[The above forms the first record of definite breeding of the Fulmar on the west side of England or Wales. We were informed in June 1940 by Messrs. J. W. Bennett and P. S. Burns that there were then five pairs of Fulmars at St. Bees. One bird was sitting in a hollow on a ledge and could be watched from the cliff top, but it could not be induced to move and neither egg or young was seen.

Mr. James Fisher informs us that several flying about the cliffs at St. Bees and settling on ledges were reported by Mr. W. B. Alexander in July, 1938 in connection with the enquiry by the British Trust for Ornithology.—Eds.]

WOODCOCK'S METHOD OF CARRYING YOUNG.

I HAVE seen Woodcock (*Scolopax rusticola*) carrying young on a previous occasion but on May 14th, 1941, I had such a particularly good and clear view of the act that a description of what I observed may be of interest.

I came on the brood suddenly. They were about one-third grown and the old bird went off with one at once. I hid up and then when she came back I stepped out of my cover quickly. She seemed to straddle one of the young from behind

and jumped off at once. Her legs were on each side of the young bird and her tail was pressed tightly round it like a curved fan, apparently to keep it from slipping out behind. The young one's legs were dangling, but I could not see any sign of her own. She flew directly away from me down a hill with her body in an almost perpendicular position, but even so she had sufficient command of the air to dodge through several oak boughs which were in her line of flight.

C. W. MACKWORTH PRAED.

FLOCK OF ROSEATE TERNS IN CHESHIRE.

UNTIL 1939 the Roseate Tern (*Sterna d. dougallii*) had not been recorded from Cheshire; in that year several were seen at the mouth of the River Dee. (*Ibis*, July, 1940). Probably it occurs there more often than was suspected, for it has been observed on the South Lancs. coast and at the Point of Air in Flint, where Mr. C. Oldham saw about six pairs (apparently not nesting) on July 15th, 1916.

On May 12th, 1941, at high tide at Hoylake I saw in a flock of about 100 Common Terns (*Sterna h. hirundo*) and a small number of Sandwich Terns (*Sterna s. sandvicensis*), what I took to be a Roseate Tern, but could not get near enough for certainty. On May 24th, however, in a flock of some 40 terns, there were few Commons and the rest—30 or more—were Roseate Terns. In bright sunlight the pink breasts of a number of them could be clearly seen, when they were at rest on a rock, and when a low-flying aeroplane put them all up their long tail-streamers were most noticeable in comparison with those of the Common Terns as they circled round together. There was a chorus of their typical "aach" alarm-cry. On the 29th there were still a good many, on the 31st six or more and one on June 8th. On each occasion there were Common and Sandwich Terns with them and on the 29th at least one Arctic (*Sterna macrura*). Little Terns (*Sterna a. albifrons*), a few of which were present, always kept aloof from the flock.

A. W. BOYD.

KITTIWAKES IN SURREY IN JUNE

On June 15th, 1941 I saw at Teddington Gravel Pits two adult Kittiwakes (*Rissa t. tridactyla*). They remained there all day, sometimes resting on the bank.

E. G. PEDLER.

ABSTRACTS.

FURTHER RESULTS OF MARKING DUCKS IN RUSSIA.

W. Wuczeticz (1939). "Seasonal distribution and migration of ducks (subfam. *Anatinæ*) on the base of bird-ringing in the U.S.S.R.

III. The Gadwall—*Anas strepera* L.; the Shoveler—*Spatula*

clypeata (L.); the Wigeon—*Mareca penelope* (L.).” Moscow (Russian and English, 4 maps).

THE valuable results already published with regard to the ringing of Mallard and Pintail in Russia (abstracted in *British Birds*, Vol. xxxii. p. 20) have been supplemented by rather less abundant data relating to three other species of ducks.

There are 80 recovery records of Gadwall ringed as adults—mostly drakes in wing-moult—in the Volga Delta—in July and August. The breeding area from which these birds were derived is indicated by spring, summer and autumn records for subsequent seasons: it lies between the fortieth and seventieth meridians, and the northernmost locality is in about 60° N. lat. Further migration is mainly down the western side of the Caspian Sea, but there are also two records from Iran, one from the eastern end of the Black Sea and two from Bulgaria. There are several records for subsequent autumns from well to the north of the ringing area, but none showing northward movements in the autumn of marking, although it is suggested that this occurs. One bird ringed in western Siberia was recovered in northern India; and there are also three records of Gadwall ringed in northern India in winter or spring and recovered in western Siberia in spring or summer.

There are 45 records of Shoveler ringed as adults—mostly drakes in wing-moult—in the Volga Delta in July and August. The breeding area from which these birds were derived is indicated by spring, summer and autumn recoveries in subsequent seasons: it lies between the fortieth and eightieth meridians, and the northernmost locality is in about 62° N. lat. Further migration is indicated by a few records from the western side of the Caspian Sea, by several from southern Russia and from the eastern Balkans, and by three from the coast of North Africa (Tunis, Libya, Egypt). There are also two records for the spring following marking from northern Italy, and one from Holland: another record from Holland is for a subsequent winter. There is a remarkable record of a recovery in Murmansk in October of the year of ringing: this seems to be the only ringing record definitely supporting the statement that after their moult some of the birds move north again and later migrate south-westwards by way of the Baltic. The late dates of some records from the winter area are noteworthy—Libya and Italy, March 20th, Bulgaria, April 3rd.

A few records of Shoveler ringed in western Siberia show some movement towards the south and south-west, and one bird was recovered in Murmansk in January of the seventh winter after ringing. One ringed on Lake Ladoga, in north-western Russia, was recorded from Holland in August of the following season. There is also a record of a Shoveler ringed in northern India in March and recovered in western Siberia in the following month; and a record of one ringed in Denmark in autumn and recovered in western Siberia next summer.

There are 23 records of Wigeon ringed as adults—mostly as drakes in wing-moult—in July (all but one) and August in the Volga Delta. The breeding area whence these birds were derived is indicated by a few records for subsequent seasons: it lies between the forty-fourth and eighty-seventh meridians—from the middle Volga basin to the sources of the river Ob—and the northernmost locality is in about 67° N. lat. Further migration is all westerly. There are single records for the first winter from each of the following:—southern Russia, Bulgaria, southern France, England and Ireland. There are records for subsequent winters from southern Russia, Bulgaria, Greece, Italy, Corsica and Denmark, and also an April record from Italy and a September record from Denmark.

Wigeon ringed in summer in western Siberia are recorded in winter from Bulgaria and Italy; and birds ringed in north-western Russia in summer and autumn from Holland in winter. There are also five records of Wigeon ringed in northern India in winter and recovered in western Siberia in spring and summer. Wigeon ringed in Great Britain, Holland and Denmark in autumn, winter or spring, and in Scotland (one) and Iceland (several) in *summer*, have been recovered in various parts of Russia and Siberia in spring, summer and autumn. The migrations of this species, as shown by ringing records from all sources, are generally discussed: reference is made to the occurrence of "abmigration" (individual migration in spring from an area of sedentary habitation) and of aberrant return from winter-quarters to a new summer area.

A. L. T.

RESULTS OF RINGING BIRDS IN EGYPT.

D. R. Mackintosh (1941). "Bird ringing recoveries." *Bull. Zool. Soc. Egypt*, No. 3, p. 7.

EGYPT is a welcome addition to the countries in which bird-ringing is undertaken, and the results will usefully extend the data provided by this method. Ringing is done in winter, and recoveries from a distance indicate the breeding areas from which the birds are derived and the paths of their migration. Isolated records include a Serin from Kazakhstan; a Chaffinch from Siberia; five Teal from Russia and Siberia (including one from 64° N. lat.); and Shoveler from Astrakhan and Siberia (83° E. long.)—as well as two Shoveler from Egypt itself in the following winter.

Pintail have been marked in considerable numbers (2,281). There is a spring record from northern Iraq; records in spring immediately after marking from Armenia and Georgia; and two autumn records from Dagestan (Caucasus). There are eleven spring or summer records (eight of them in the first season after marking) from an area lying between the Ural Mountains and the River Ob, and between 50° and 63° N. lat. There is also a record in the first summer after marking from between the Petchora and the White Sea, almost on the Arctic Circle; and an autumn record from Finland. In addition, four birds were recovered in Egypt in winter or spring of the next season.

Quail have been ringed to the number of 4,236, mostly during March. There are three records from Syria, two of them in the spring of marking and the other undated; and single records from Sinai, Macedonia and Bulgaria—all in the next autumn. There are eleven spring, summer and autumn records (ten of them in the first season after marking) from the part of Russia lying north and east of the Black Sea, between the Dnieper and the Volga.

A list is added of known records of birds ringed elsewhere and recovered in Egypt, thirteen species being represented—the White Stork and Lesser Black-backed Gull most numerous. The places of origin lie mostly in Russia and the European countries bordering it, from Finland to Rumania; but there are also records from as far west as Denmark (White Stork and Lesser Black-backed Gull) and north-western Germany (Red-backed Shrike).

Maps are given for the Quail and the Pintail. In the latter case records from all sources are included, and an attempt is made to indicate migration routes. These are made to converge from the breeding area to focal points and then to diverge to various winter quarters. This appearance is of course an artefact, due to intensive ringing of migrants at such localities as Fanö and the Volga Delta.

A. L. T.

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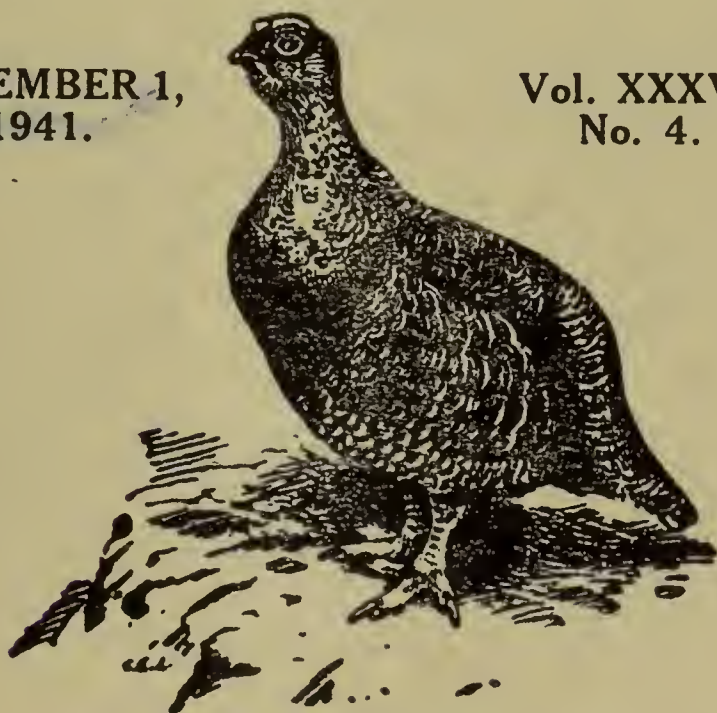
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FURTHER DATA ON NEST-SANITATION.

BY

B. W. TUCKER, M.A., M.B.O.U.

THE present paper is a natural sequel to that by R. H. Blair and B. W. Tucker (*antea*, Vol. xxxiv, pp. 206-215, 226-235, 250-255). That paper, it may be recalled, summarized the observations on the nest-sanitation of over 70 species collected in the course of an enquiry by the Cornwall Bird Watching and Preservation Society, and to this a résumé of the data already published in the literature on the species in question was added by the present writer. The present communication deals with the published data on British-breeding species which were not studied in the Cornwall enquiry and on species included in the British list which do not breed in the British Islands. It also includes original observations on a number of these species kindly supplied by several correspondents, namely Messrs. E. J. Hosking, G. C. S. Ingram and G. K. Yeates, whose contributions can be identified by their initials. The paper should be considered in conjunction with the previous one and especially with the introduction to the latter, which leaves only a few points to be added or specially re-emphasized here.

As before, the valuable series of references in the note-books of the late Rev. F. C. R. Jourdain has been used as a basis and others have been added by the present writer. All the references have been examined and checked in the original with the exception of a very few in some of the less accessible German publications, which have to be quoted at second-hand. As before, owing to the widely scattered nature of the data, it is not to be supposed that no references have been overlooked, but it is not thought that the omissions can be many or important. It was pointed out in the previous paper that in the past insufficient account has been taken of the tendency to a change in sanitation behaviour with the age of the young and that recorded information was often defective because the age of the young was not noted or the observations were not prolonged over a sufficient period or, again, because no indication was given as to whether they were sufficiently prolonged or not. A number of the observations now quoted are more or less lacking in precision in these respects, but, as before, it has been thought useful to indicate just how much is or is not known up-to-date about each species. It may be hoped, and indeed confidently expected, that the forthcoming enquiry of the British Trust for Ornithology, which

is a direct outcome of the Cornwall investigation, will fill in many gaps.

A point has already been reached, however, where it is possible to make some generalizations with regard to nest-sanitation in the different groups of birds. It is of interest that active sanitation by the parents, whether swallowing or carrying away or both, is practically confined to the Passerine birds (Passeriformes) and the orders which are generally recognized as most nearly allied to them, namely the Pici-formes, which includes the woodpeckers, the Coraciiformes,



GOLDFINCH AT NEST.

Showing mass of fæces round edge of nest, characteristic of some finches, resulting from neglect of sanitation in at least the later stages of fledging.
(*Photographed by E. J. Hosking*).

which includes the kingfishers, bee-eaters, rollers and hoopoes, and the Apodiformes, represented by the swifts. In the three orders last named, however, there is much variation in behaviour. Swallowing is recorded in the Alpine Swift while the nestlings are young, but what happens in the Common Swift does not seem to be known. Active sanitation by the parents has been observed in all four British members of the woodpecker group, but in the Wryneck behaviour is particularly variable (*cf.* Blair and Tucker, pp. 252-3). It is not without interest that the three birds whose nest-sanitation, if any, is

most defective, namely the Kingfisher, Hoopoe, and Roller, are all members of one order, and the last two even of the same sub-order as recognized by Wetmore, whose views are adopted in the *Handbook of British Birds*. However, the evil reputation of the Hoopoe in this connexion seems to be somewhat exaggerated, as may be judged from the discussion in the systematic section of this paper, and regular removal of faecal matter from the nest-hole by some pairs is thoroughly established. Probably—as appears to be the case in various other hole-nesting birds—individual behaviour of both parents and young in the matter of sanitation is considerably influenced by the form and depth of the hole and the position of the opening.

It is doubtless because of their largely hole-nesting and nocturnal habits that so little is recorded about the owls. The writer does not profess to have given the sanitary condition of owls' nests any special attention, but such nests with young as he has examined have not been noticeably dirty. Nevertheless there seems to be no record of any special sanitary precautions by the parents with the solitary exception of the observation attributed by Groebbels to Hennings (*Der Vogel*, Bd. ii, p. 406) that the faeces of young Short-eared Owls are swallowed by the female. It will be seen, however, that this statement is in need of confirmation.

Amongst the diurnal birds-of-prey it is practically universal for the markedly liquid faeces of the young to be discharged with considerable force over the edge of the nest, the nestling taking up for this purpose a characteristic stance with the body tilted so that the head is depressed and the posterior elevated as much as possible. This behaviour, however, is not developed immediately on hatching, as pointed out by O. and M. Heinroth, who observe that "the young in the first days evacuate as they shift backwards a few centimetres and in so doing naturally foul the nest. The old birds apparently renew this soiled nest-material." (*Vögel Mitteleuropas*, Bd. ii, p. 60). In addition pellets are, of course, produced and in some cases accumulate in the nest or at the nest-site, but in the case of the Golden Eagle and Hen-Harrier their active removal has been recorded and this probably occurs in other species besides these two. Amongst flesh-eating birds the liability of fragments of food to get trodden into the nest and the tendency of the parents in some cases actually to bring in more carcasses than the young can consume may be considered as constituting an extension of the sanitation problem now under discussion, but no attempt has been made here to deal systematically with the treatment of food remains by birds-of-prey. It must suffice to

observe that such perishable remains are frequently simply ignored and reduce the nest—humanly speaking—to a more or less offensive condition, but in other cases the larger portions, at any rate, are carefully removed. It would be interesting to know whether any distinction is made in the treatment of such uneaten food remains and of pellets. H. B. Macpherson describes the Golden Eagle as removing both from the eyrie.

Amongst the herons and storks and their allies the fæces are usually discharged over the edge of the nest in much the same way as in the birds-of-prey, but some variation in behaviour is recorded, and in some species, such as the Spoonbill, the nests become much fouled with excrement. Attention may be drawn to the very interesting observation of Stoll on the Black Stork, which shows that swallowing of fæces may occur, at least occasionally, in a group in which parental sanitation is almost certainly not usual. This suggests reflections on the origin of the habit in groups in which it occurs regularly. Is there something actually palatable to the adult birds in the waste products of the nestlings, which might account for the beginnings of a habit which may be supposed to have become established as a regular practice in many species because the removal of fæces from the nest is beneficial? And do the parents actually derive any nutriment from this material, as Witherby (*Knowledge*, 1898) and Wilson (*Naturalist*, 1912, pp. 50-1) have both suggested? Some doubt is thrown on both these possibilities by the fact that so often the fæces are carried away and not swallowed and by the fact that birds will remove other extraneous and inedible materials from their nests. Closer research may make it possible to carry such speculations further than they can be usefully pursued at present.

With regard to the groups of nidicolous birds not already mentioned a certain amount of scattered information is recorded, but calls for no special comment beyond observing that a majority of the colonial sea-birds are markedly insanitary in their nesting arrangements.

It only remains to add that for present purposes the term nest-sanitation is not understood as covering the disposal of their own fæces by incubating adult birds. The usual and obvious method is for defæcation to take place during intervals off the nest, but in some cases it may be performed without leaving the nest. In such instances the incubating bird may eject the fæces over the edge of the nest much as is done by the young, as has been observed in some birds-of-prey, e.g. Peregrine Falcon (D. Nethersole-Thompson), while in others

the fæces may be deposited on the edge of the nest or around it or even in the nest-hole in some hole-breeding species. But these comparatively infrequent cases are not dealt with in the present paper.

With these preliminaries we may proceed to the systematic treatment of the species for which information is available. Sanitation behaviour in several species is illustrated by photographs kindly supplied by Mr. E. J. Hosking.

JAY (*Garrulus glandarius rufitergum*).

Fæces swallowed at nest (A. Buxton, *Trans. Norfolk and Norwich N.H.S.*, 1936, p. 170). Male very scrupulous,



HAWFINCH.

Female swallowing fæcal capsule.
(Photographed by E. J. Hosking).

waiting behind nestlings after each feed, pouncing on and swallowing excrement as soon as it appears ; record six on a single occasion. Female also helps . Probing observed (G.K.Y.).

GOLDEN ORIOLE (*Oriolus o. oriolus*).

Fæces at first eaten by female, afterwards carried away and dropped (K. Morris).

HAWFINCH (*Coccothraustes c. coccothraustes*).

Male apparently removed and swallowed fæces from newly

hatched young. Female also seen to swallow (F. Pitt, *Country Life*, July 29th, 1939). Nest kept scrupulously clean until approximately 48 hours before chicks left nest. Fæces removed by both sexes and usually carried away, but female observed swallowing them until young were well-feathered. Photograph shows female swallowing faecal capsule (E.J.H.).

LESSER REDPOLL (*Carduelis flammea cabaret*).

Occasionally seen to swallow (H. Meyrick, *Zool.*, 1909, p. 270). Carrying only observed in earlier stages, later swallowing and carrying by both parents (W. Wilson, *Nat.*, 1912, p. 50). Swallowed by female during first five days; not under observation subsequently. Prodding observed (E.J.H.). Carried by female from young 6-7 days old; rim of nest in very dirty state when young nearly ready to leave (G.C.S.I.).

SERIN (*Serinus canarius serinus*).

Left behind on edge of nest (F.C.R.J., G. Niethammer, *Handb. deutsch. Vogelkunde*, i, p. 72).

SCARLET GROSBEAK (*Carpodacus e. erythrinus*).

Encapsuled fæces at first extruded immediately after feeding and swallowed by both sexes. Later deposited by young on edge of nest and removed at next feeding. Apparently greater part swallowed up to time of fledging (O. Steinfatt, *Beit. Fortpfl.-biol Vög.*, 1937, p. 219).

CROSSBILL (*Loxia c. curvirostra*).

Not removed from edge of nest; first noted six days after hatching (W. Nolte, *Journ. f. Orn.*, 1930, p. 6). Confirmed in Scottish race (*L. c. scotica*) by D. Nethersole-Thompson.

REED-BUNTING (*Emberiza s. schæniclus*).

Removal by male mentioned (J. H. Owen, *Brit. B.*, xxiv, p. 159). Removed by both sexes (H. E. Howard, *Introduction to the Study of Bird Behaviour*, p. 16). Fæces of young 5 days old carried by both sexes; only swallowed twice in several hours on two days (R. Chislett). Carrying observed; chicks 5-6 days old (G.K.Y.).

TREE-SPARROW (*Passer m. montanus*).

Fæces of young c. 8 days old carried by parents; swallowing not seen (R. Chislett).

BLACK LARK (*Melanocorypha yeltoniensis*).

Carried by female in confinement (R. Phillipps, *Avic. Mag.*, 1899, p. 162).

AMERICAN WATER-PIBIT (*Anthus spinoletta rubescens*).

Carried away by both sexes (H. S. Johnson, *Wilson Bull.*, xlv, 1933, pp. 114-7).

SCOTTISH CRESTED TIT (*Parus cristatus scoticus*).

Nest cleaned by female only ; fæces carried and dropped at a distance (S. Smith, *Brit. B.*, xxxiv, p. 169). Female carries away fæcal sacs in bill (D. Nethersole-Thompson).

MARSH-TIT (*Parus palustris dresseri*).

Carried by both parents ; age of young uncertain (G. C. S.I.).

BEARDED TIT (*Panurus b. biarmicus*).

Female undertakes ordinary sanitation of nest (E. L. Turner, *Broadland Birds*, p. 18). Fæces carried by both sexes ; removal by male shown in photograph (E.J.H.). Female carried fæces from nest about every second visit (Aug. 23-Sept. 4) ; male never seen to do so (J. B. Watson).



BEARDED TIT.

Male removing fæcal capsule.
(Photographed by E. J. Hosking).

RED-BREASTED FLYCATCHER (*Muscicapa p. parva*).

Fæces carried away by both parents (G. Niethammer, *Handb. deutsch. Vogelkunde*, i, p. 286).

(To be continued).

CHRISTOPHER MERRETT*

AND HIS

PINAX RERUM NATURALIUM BRITANNICARUM

BY

SIR HUGH GLADSTONE.

CHRISTOPHER MERRETT, the son of Christopher Merret, was born at Winchcomb, in Gloucestershire, on February 16th, 1614. In 1631 he became a member of Gloucester Hall, Oxford, and later removed to Oriel College. He took his B.A. degree in 1635, and then—devoting himself to the study of medicine—graduated M.B. in 1636, and M.D. in 1643. He afterwards settled in London, became a Fellow of the Royal College of Physicians in 1651, and Gulstonian lecturer in 1654. He was one of the first members of the Royal Society and, through the influence of his friend Dr. William Harvey (1578-1657), was put in charge of his library and museum when he presented it to the Royal College of Physicians in February 1654. About the time of the accession of Charles I, the College, requiring more accommodation, had taken a house at the bottom of Amen Corner which was subsequently purchased by Dr. Baldwin Hamley (1600-1676) who gave it, in 1649, to the College; this was the seat of the College till it was destroyed by the Great Fire of London and it is interesting to note that Merrett dedicated his *Pinax Rerum Naturalium Britannicarum* to Dr. Hamley.

Merrett resided in the College house, at Amen Corner, and is believed to have acquired a considerable practice. When London was visited by the Great Plague in 1665 the College of Physicians was deserted by the Faculty; the rooms left empty of all but Dr. Merrett the Librarian and Keeper of the College and he had not been long alone when the increasing inroads of the Plague upon the City began to alarm him; or—as is perhaps more likely—alarmed his family beyond endurance: he too fled into the country.

* This biography has been compiled from W. H. Mullens and H. Kirke Swann: *A Bibliography of British Ornithology*: 1917: pp. 396/397. the article by W. H. Mullens: *British Birds* (Magazine): Vol. ii: pp.: 109/118, 151/163: E. M. Nicholson (editor of) Gilbert White: *The Natural History of Selborne*: 1927: p. 138: R. T. Gunther: *Early Science in Oxford*: 1937: pp. 111/112, 287/288: Walter George Bell: *The Great Plague in London in 1665*: 1924: p. 62: *Chambers' Encyclopædia*: 1091: *Dictionary of National Biography*: 1906: and other sources.

On September 2nd, 1666 a fire broke out in London which raged with such fury as in five days to have involved 273 acres, 400 streets, 13,200 private houses, 88 churches and St. Paul's Cathedral. This was the Great Fire of London* and in the conflagration the bulk of the library belonging to the College and Merrett's house were destroyed. It may be presumed too that the premises, "*in Cæmeterio Divi Pauli*," of the printers of his *Pinax* were also consumed and that the first edition—bearing date 1666—perished, almost entirely, in the flames.

Thereafter the College of Physicians gave up their ancient site to St. Paul's and considered their librarian to be no longer necessary. Merrett, however, held the contrary opinion and brought an action in the King's Bench against the College in which he claimed he was entitled to his office for life. In this claim he failed and his expulsion from his Fellowship in 1681—nominally for non-attendance—may have been due to his action. He was, perhaps, naturally quarrelsome for in 1670 he had an historical scrap with the Apothecaries whom he accused, in a very exhaustive tract, of all possible "Frauds and Abuses." Latterly he resided in his house in Hatton Garden where he died on August 19th, 1695, and was buried "12 feet deep in the church of St. Andrew's, Holborne."

Besides the *Pinax* Merrett wrote numerous other works, chiefly on medicine, and he also contributed several papers on "vegetable physiology" to the *Philosophical Transactions*. His name is commemorated in botany; S. F. Gray having, in his *Natural Arrangement of British Plants* (1821), given the name *Merrettia* to a group of unicellular *Algæ*. One of his botanical discoveries was that a change of colour of wild succory from blue to white was to be attributed to a transplanting to a poor soil, and it is of interest to note that his erudition as an ichthyologist is specially mentioned by Walter Charleton (1619-1707) in his *Onomasticon Zoicon*: 1668: and *Exercitationes de Differentiis & Nominibus Animalium*: 1677.

Merrett in his *Pinax Rerum Naturalium Britannicarum* made an attempt to make a list of the vegetables, animals and minerals of Great Britain. Of the 223 pages of which the book consists, 165 are devoted to botany, 42 to zoology and

* The Lord Mayor, speaking at the Mansion House—on January 13th, 1941—of the recent air-raids on London, referred to the Great Fire and said that "nothing like that faced them today" (*The Times*: January 14th, 1941): in these air-raids no less than thirty-seven publishers' premises were damaged or destroyed (*The Daily Mail*: January 8th, 1941).

the remainder to minerals. In making his catalogue Merrett was content—at any rate as regards the birds—to do little more than to enumerate those which he considered he had identified from the descriptions of Ulysses Aldrovandus (1522-1607) and of Johannes Johnstonus (1603-1675). The English names are added in many cases, but the few short notes are rarely original and Merrett does not seem, up to this time, to have devoted much personal attention to the observation or study of birds. His *Pinax* is, however, of ornithological importance since it comprises (pp. 170/184) the earliest list of British birds; about one hundred and seventy being named.

PINAX RERUM NATURALIUM BRITANNICARUM: 1666.

“This” (so said Messrs. Quaritch from whom I bought this book, for £6 on October 31st, 1940) “is a particularly nice copy and the book itself is very rare in any condition; moreover this copy is one of the very few that was rescued from the Great Fire of London; most copies are dated 1667: so far as our records show this is the only copy which has passed through our hands.” In reply to my further enquiry Messrs. Quaritch wrote:—“We very much regret that we cannot tell you the previous owner of your copy of Merrett’s *Pinax*: 1666. We purchased this from the library of ‘A Learned Society’ and the stipulation was that we were not to divulge their name, and all bookplates and library marks had to be removed before they were offered to the public. It may interest you, however, to know that this copy may have been purchased when published, by the ‘Society.’”

Additional interest attaches to this copy (which is exceptionally tall: 6 $\frac{3}{16}$ x 4-in.) since the contemporary calf binding bears on the spine, the Crest; and on both sides of the binding, the Arms; of Sir Edward Bysshe* who—on p. [4]—is mentioned as “Edoardus Bish, Clarencieux,” a benefactor of

* SIR EDWARD BYSSHE (1615 ?—1679) herald; has been described as “a great encourager of learning and learned men.” He was more erudite and more perspicuous than his predecessors and was the first to treat the subject as an antiquary and historian. He entered Trinity College, Oxford, 1633; became barrister of Lincoln’s Inn; M.P. for Bletchingly, 1640; and was appointed Garter King-of-Arms by Parliament, 1646-60. He was M.P. for Reigate, 1654, and for Gatton, Surrey, 1659; was appointed Clarenceux King-of-Arms 1661; Knighted 1661, and was M.P. for Bletchingly 1661. He edited several heraldic treatises and (1665) *Palladius “de Gentibus Indiæ et Bragmanibus.”* The records of the College of Arms give a Pedigree, in the Herald’s Visitations, and the following Arms and Crest of Sir Edward Bysshe of Smalfield, Knight, Clarenceux King-of-Arms, 1662:—

Arms: “Or a chevron between three roses Gules.”

Crest: “A hind trippant (Argent).”

the *Musæum Harveani* (the Royal College of Physicians) of which Merrett was the first librarian.

It is to be observed that Merrett dates the "*Epistola Dedicatoria*" of his *Pinax* "Aug. 1666" and that the Great Fire of London—in which it is believed that this, the first, edition was almost entirely destroyed—raged early in September of that year. This may be the reason for its scarcity; I have only seen two other copies; the one in the British Museum Library which is interleaved and is catalogued as "annotated by the Author"; the other in the Natural History Museum Library at South Kensington. There are, so I understand, copies in the libraries of the Philadelphia Academy, U.S.A., the McGill University, at Montreal, the Royal Society, London, and another (lacking pp.3/4) in the Bodleian, Oxford. It is, moreover, remarkable that, during the last twenty years, I have never noticed a copy for sale either at auction or in booksellers' catalogues.

It does not seem to have been recorded that in this edition pages 97/98 and 178/179 are wrongly numbered 87/88 and 162/163 and that the two last pages (numbered 220/221) should be 222/223: thus bringing them into conformity with the two later publications.

The second issue, or edition, is dated MDCLXVII; the type appears to have been reset throughout, the pagination runs in proper sequence but, though the title and collation are different, it does not differ materially from the edition of 1666. I have, however, discovered some discrepancies between these two editions and these I have appended to these notes.

The third issue, or edition, is styled *Editio Secunda* on its title page which is dated 1667. It is, at best, simply a reprint of that entitled MDCLXVII but with a different title page and it is very remarkable that in three copies which I have handled the MDCLXVII title page has been cut out and the new 1667 title page pasted on to the stub of the original.

His Arms—stamped on the binding of the book—are within a *Collar of S.S.* to denote his office of Herald, and his Crest is stamped on the six panels of the spine. It is to be noted, however, that, in the second panel, there has been super-imposed (at a later date) a green leather label which is lettered—in gold—Merrett/Pinax/Rerum/Natural. The meaning of the heraldic term *bysse* being in dispute (wolf, serpent and doe or biche having been suggested) it is surely interesting—if not significant—to find that a "hind [doe or biche] trippant" should be the crest of one bearing the surname Bysshe.

Six lines of poetry written, in pencil, on a leaf at the end of the book are of no importance since they have been added, by some subsequent and unknown owner, much later than 1666. Although very faded, infra-red photography has revealed that they are the concluding

I am told that other copies (which have been examined on my behalf) show no sign of this extraordinary method of substitution but it may be that in these the new title page has been inserted less obviously. In any case the text of the MDCLXVII and 1667 issues is identical.

It is difficult to speculate why a fresh title page should have been substituted unless, perhaps, it was to advertise the fact that the book could be purchased of "*Sam. Thomson in vico vulgo dicto Ducklane*:" or it may be but an example of "that contemptible form of lying under which publishers have endeavoured to persuade the public of the rapidity of their sales." It is as difficult to think of a reason why the original edition of 1666 should have been ignored. The greater part of the library belonging to the Royal College of Physicians and Merrett's private house [besides, possibly, the premises of the printers of his book] perished in the Great Fire of London. Is it therefore presumable that, in this holocaust, the original edition of 1666 was so extensively destroyed as to warrant its being disregarded altogether and that it was therefore ignored when publishing the MDCLXVII edition? The extreme rarity of copies bearing date 1666 is the only available evidence in support of this presumption but could it be proved to be fact it would follow that the 1667 edition, or issue, would have a claim to be entitled *editio secunda*.

The three issues—or editions as I prefer to style them—collate as follows and they can be readily distinguished by the difference in their respective title pages: it may be noted, in particular, that the dates of the original edition and of the "*editio secunda*" are in Arabic numerals.

1666: 1 Vol. (6 $\frac{3}{8}$ x4-in.) pp. 30 un. (including title page)
+ [2] + 221 [*sic.*] + [1] List of Authorities.

. . . . *Londini Impensis Cave Pulleyn ad Insigne Rosae/in*
Cæmeterio Divi Pauli. Typis F.&T. Warren,
Anno 1666.

sentence of Berkley's *Siris*, Imitated by Sir William Jones (1746/1794). They are to be found in *The Poetical Works of Sir William Jones*: 1810: Vol. 1: p.290; where they read as follows:—

"Before thy mystic altar, heav'nly Truth
I kneel in manhood, as I knelt in youth;
Thus let me kneel, till this dull form decay,
And life's last shade be brightened by thy ray:
Then shall my soul, now lost in clouds below,
Soar without bound, without consuming glow."

These lines were written by Sir William Jones in Berkley's *Siris*; they are, in fact, a beautiful version of the last sentence of the *Siris*, amplified and adapted to himself. He that would make a real progress in knowledge, must dedicate his age as well as youth, the latter growth as well as the first fruits, at the "altar of Truth."

MDCLXVII: I Vol. ($6\frac{1}{3} \times 3\frac{5}{8}$ -in.) pp. 32 un. (including title page) + 223 + [I] List of Authorities.

. . . . *Londini, Typis T. Roycroft, Impensis Cave Pulleyn.* MDCLXVII.

1667: I Vol. ($6\frac{1}{4} \times 3\frac{3}{4}$) pp. 32 un. (including title page) + 223 + [I] List of Authorities.

. . . . *Editio Secunda.* . . . *Londini, Typis T. Roycroft, Impensis Cave Pulleyn, Prostat apud Sam. Thomson in vico vulgo dicto Ducklane.* 1667.

Although there is no evidence that Merrett published any edition of his *Pinax* later than 1667, he appears to have contemplated doing so. In a letter to him—of date July 13th 1668—Sir Thomas Browne (1602-1682) writes “I should be very glad to serve you by any observations of mine against yr. second edition of your *Pinax* which I cannot sufficiently commend. I have observed and taken notice of many animals in these parts whereof 3 years agoe a learned gentleman of this country desired me to give him some account, which while I was doing ye gentleman my good friend died.”* This letter is not only of interest since it refers to a possible “second edition” of the *Pinax* but also because it disposes of the suggestion that Sir Thomas Browne’s notes were originally prepared for Merrett’s use. In another letter—of date December 29th, [1668]—Sir Thomas writes:—“I perceiue that you haue proceeded farre in your *Pinax*”† and his correspondence with Merrett certainly continued till May 1669‡. It is possible that in the copy of the 1666 edition of Merrett’s *Pinax* in the British Museum Library (which is interleaved and catalogued as “annotated by the author”) there may be manuscript corrections, or additions, which would provide evidence of Merrett’s intention to publish another edition. Under existing conditions it has been impossible to examine this copy and it can be definitely stated that no later edition of his *Pinax* than that of 1667 is known. Elliot Coues§—quoting Engelmann—ascribes another edition to 1704 but this would appear very doubtful and I have never seen, or otherwise heard of, an edition of this date.

An excellent appreciation of Merrett’s work was given by W. H. Mullens in this magazine (*antea*, vol. ii, pp. 109/118,

* *Notes and Letters on the Natural History of Norfolk* *From the MSS. of Sir Thomas Browne* *With notes by Thomas Southwell* : 1902 : p. 57.

† *Tom. cit.* p. 69.

‡ *Tom. cit.* p. 89.

§ *Fourth Instalment of Ornithological Bibliography* *British Birds* : Washington : 1880 : pp. 361, 363.

Many of these discrepancies are trivial but I think the following comments on them are justifiable. It is only to be expected that in a later edition errors in an earlier should be corrected and it is therefore not surprising to find (p.172, l.2) the correction tab. 16 for tab. 15 : lapidde corrected to lapide (p.177, l.10) : and the pages wrongly numbered 162, 163, 220 and 221 correctly numbered 178, 179, 222 and 223. I have not yet been able to ascertain whether G.694, or G.604 (p.172, l.14) and G.190, or G.100 (p.181, l.32) are correct. It is certainly curious to find an undoubted error in the later edition (p.183, l.30) where the words "*Non est avis*" make nonsense since the word "*Nun*" (a recognised name for the Smew) has been printed "*Non*" and it is unfortunate that *Kestrel* (p.170, l.22) should have been reproduced as *Keshrel*. The word which in 1666 appears as *P rcnos* (p.171, l.13) and in MDCLXVII is altered to *Peronos* should surely have been *percnos*. I regret that *Screek* (p.171, l.3) should have become *Skreek* : *Magpye* (p.172, l.9) rendered *Magpie* : and *Throssel* (p.176, l.25) termed *Thrussel*. Certainly it seems a pity that *Pelican* (p.181, l.7) should be *Pelicane* and *Mire Drumbel* (p.181, l.30) changed to *Mire Drumble*. The seventh letter is missing in the word which has been spelt *Crickaleel* (p.184, l.3) and here I should have expected *Crickateel*. The mis-spelling of Francis Willughby's name (p.180, l.21, 29/30 : and p.183, l.3, 7, 12) as Willoughby would appear careless but has the merit of consistency as it is printed thus throughout in the MDCLXVII edition : but in that of 1666 (p.171, l.5 and p.172, l.19) it is wrongly spelt.

Possibly more glamour attaches to William Turner's *Avium Praecipvarum* : 1544 :—since he is regarded as "the father of British Ornithology"—but I have come to the conclusion that the 1666 edition of Christopher Merrett's *Pinax Rerum Naturalium Britannicarum*—which contains the first list of British birds is certainly the rarer of the two books.

NOTES

MULTIPLE NEST BUILDING BY SPOTTED FLYCATCHER.

A NEST of this bird (*Muscicapa s. striata*) was begun on May 27th, 1941 on the top of a nesting-box in an alcove of my house in Bucks, but was later abandoned, owing probably to the nesting material slipping off the smooth lid. The Flycatchers then turned their attention to the narrow ledge above the alcove and started building three nests, each rather less than a yard away from the next. The thin twigs of an ampelopsis twined over the ledge making the nesting sites very similar to one another. One nest gradually became bigger than the others, but all three were subsequently abandoned. On the 20th June a fourth nest was started on the same ledge, almost four feet from the nearest of the other three, and this one was completed and eggs laid in it, the first egg being deposited on June 25th, almost a month after nest construction had first begun. Flycatchers had built nests on the ledge four seasons out of the previous five, although only in two years had young been successfully reared. In the other two cases the nest had fallen off the narrow ledge. CYRIL E. MARTIN.

[A previous case of multiple nests made by the Spotted Flycatcher—six nests in an iron shoot—was recorded by Mr. A. H. Machell Cox (*antea*, Vol. xxii, p. 118) and in the same volume (p. 85) Mr. A. W. Boyd gave a case by the Pied Wagtail—six nests in a group of ventilating holes. In commenting on the subject in a previous volume (xix, p. 97) the late F. C. R. Jourdain remarked that all such cases, in five different species (Blackbird, Song-Thrush, Robin, Redstart and Chaffinch) had occurred when the birds were in contact with objects constructed by man, such as rungs of a ladder, spaces between rafters, etc., and that it was evident that they failed to distinguish between such similar adjacent sites. Other similar cases have been reported from time to time in various species.—EDS.]

UNUSUAL FECUNDITY OF BLACKBIRD.

IN April, 1941 a pair of Blackbirds (*Turdus m. merula*) hatched out four eggs from a nest built in a small macrocarpa tree in my garden at Cheddar, Somerset. A second nest was built on a lateral branch of a cedar and four eggs were laid. The young left this nest on the morning of May 31st and the

female at once commenced to re-line the nest with lumps of moss. On this same day I watched both the male and female feed young of both previous broods. These young birds, of which certainly one was from the first nest, were fed by the female during incubation of the third set of eggs. The young of the third brood left the nest on June 30th and on this date a new nest was commenced in a clematis bower about seven feet from the ground. The first egg was laid on Friday morning, July 5th and in the evening about 7 p.m. [G.M.T.] I had occasion to visit the nest again, and on taking out the egg to show a friend found *two* eggs in the nest, both laid on this date July 5th. On July 7th incubation commenced with four eggs as full complement. Thus, the nest was built and four eggs laid in eight days. Four young hatched in due course, but tragedy overtook them. On the 25th I found the hen dead on a path and the four young dead in the nest.

These notes refer undoubtedly to the same pair of Blackbirds, and watching was quite easy in such a small area. I have not myself known before of any wild bird hatching four broods in one season and that this bird continued to lay its full clutch of four from first to last is noteworthy. STANLEY LEWIS.

STRANGE BEHAVIOUR OF LONG-EARED OWLS IN A THUNDERSTORM.

MR. Eric J. Hosking's article (*antea* p. 2) on the Long-eared Owl (*Asio o. otus*) prompts me to put on record the strange behaviour of five of these birds during a thunderstorm. I was building a hide on a pair of these birds in a Northumberland copse, and my friend, Mr. H. A. Patrick, was a little way off in the wood. Suddenly two loud claps of thunder pealed out and more followed. Mr. Patrick was thereupon mobbed by no less than five Long-eared Owls. The birds stooped at him like Skuas, at intervals sitting on a stone wall snapping their beaks. Although one pair of these birds was indeed already disturbed by my presence up the nest tree, I have no doubt that the mobbing was not due to that cause but to the thunder, for it ceased when the storm ended, nor was I even mobbed at the nest itself, which contained eggs and not chicks.

G. K. YEATES.

AERIAL DISPLAY BY A PAIR OF GOLDEN EAGLES.

IN Inverness-shire D. Stubbart and I witnessed an interesting display on June 7th, 1941 of a pair of Golden Eagles (*Aquila ch. chrysaëtus*). The young had hatched and so far as I know

were still in the eyrie though I had not time to verify this. The female bird came over the hill from the direction of the nest and was joined by the male from the opposite direction. They circled round each other, spiralling a little, but not gaining much height, then suddenly gathering speed approached each other and appeared to be going to collide head on, but at the last moment both birds put out their legs and the female dropped below and turned over on her back ; the legs touched for an instant exactly as an acrobat touches his partner for balance, and she completed the turn. Circling recommenced and the next time they met she did two complete turns, the legs touching at each turn when she was on her back. They then began to gain height in spirals and at the final meeting they flew towards each other at very high speed, the female performed three turns and as she finished the third the male did a complete turn above her. The turns were done with extraordinary rapidity and it was a fine sight against a blue sky with brilliant sunshine lighting up every feather. After the display both birds spiralled to a great height and flying towards the head-waters of the stream where the eyrie is situated, disappeared behind the hills.

WINIFRED M. ROSS.

MARSH-HARRIER IN SUSSEX.

ON July 20th, 1941, at Frant, we noticed a big bird some distance away carrying out aerial evolutions. Fortunately it made its way in our direction and came right over us, in taking an easterly course. The good view we had enabled us to identify the bird to be a Marsh-Harrier (*Circus æ. æruginosus*)—probably an adult male.

We have, on different occasions, both studied this species on the Norfolk Broads which helped in readily identifying the bird.

D. W. MUSSELWHITE AND R. WARE.

RED-BREASTED GOOSE IN GLOUCESTERSHIRE.

ON February 16th, 1941, we had the good fortune, in company with Mr. W. B. Alexander and several other observers, to obtain very good views with field-glasses and telescope of a Red-breasted Goose (*Branta ruficollis*) accompanying a large flock of some 2-3,000 White-fronted Geese on the "New Grounds" of the River Severn in Gloucestershire. The birds were grazing on the saltings in a very favourable place for observation, so that we were able to watch them at leisure and to observe details of the plumage of the Red-breasted Goose, as well as the characteristically rapid movements of

its head in plucking grass, which contrasted noticeably with those of the White-fronts. On February 23rd, H.H.D., in company with Dr. J. D. Mills, had a still better view in a first-rate light with a 30 x telescope at no more than 200 yards. On February 24th the Rev. F. L. Blathwayt had a distant view of what he feels fairly confident was the bird, but neither he nor Mr. Alexander, who were there again on March 1st and 2nd respectively, could find it on those dates. It appears, however, from information given to H.H.D. by the keeper and Major Algar Howard, that it was fairly certainly seen on February 26th, when goose-shooting took place.

Although the winter was well advanced the bird showed unmistakable signs of immaturity and must have been one hatched in the previous year. The white markings on the head, neck and breast and the colour demarcation generally were less sharp than in a fully adult bird, the red was hardly so rich, and there was a certain amount of black spotting on the lower part of the russet breast. On the 16th there appeared to be also a certain amount of whitish flecking on the russet portions of the neck and breast, but this was less marked at closer range on the 23rd and it is possible that the appearance was due to ruffling of the feathers by the wind. Skins of two immature birds examined subsequently by H.H.D. at the Bristol Museum showed evidence of whitish flecking on neck and breast only where the plumage was ruffled and the whitish bases of the feathers revealed. Black spotting on the lower parts of the russet breast and the indistinct colour demarcation on head and neck were, however, marked features in each case. Both skins lacked full data, but were obviously of birds considerably younger than the one under discussion. It may be added that under the very favourable conditions on February 23rd the legs, owing possibly to the muddy state of the ground, looked greyish-black rather than jet-black and it was possible to see that the bird bore no ring. Its powers of flight appeared quite normal.

The fact that it was evidently a 1940 bird immediately suggested the possibility that it might be a genuinely wild individual and not an escape from captivity, and one of us (B.W.T.) has been at some pains to ascertain whether any Red-breasted Geese were in fact reared in this country last year. The Duke of Bedford, Mr. R. Stevens, Mr. J. Spedan Lewis and Mr. J. C. Laidlay have all kindly replied to enquiries, and the upshot is that none of these gentlemen reared any of these geese last summer, with the exception of

Mr. Spedan Lewis, whose birds, however, have never left Leckford Abbas. There thus seems to be good ground for believing that the Severn bird was a wild one, and it may be of interest to recall that one of the few other British specimens was an adult shot at Oldbury-on-Severn on November 18th, 1909 (*antea*, iii, p. 376), which has recently been acquired for the Bristol Museum from Mr. H. Knapp, who shot it and in whose possession it has been in the interval.

H. H. DAVIS AND B. W. TUCKER.

INCREASE IN SHELD-DUCK IN SUFFOLK.

A STAY in S.E. Suffolk in the spring of 1941 showed that the population of Sheld-Duck (*Tadorna tadorna*) has increased greatly during the past 15 years, since C. B. Ticehurst (*A History of the Birds of Suffolk*) estimated that there were in 1925-27 at least 187 pairs in the county, a figure which in its turn showed a considerable increase since the beginning of the century. I was not able to work the estuaries fully from end to end, but counts made at different dates during April and May suggested the following numbers:—50 pairs on the Alde estuary between Iken and Aldeburgh; 12 pairs at the only spot on Butley Creek which I visited; 350 pairs on the Deben; 375-400 pairs on the Orwell; 30 pairs at Brantham on the Stour, and Capt. G. Fenwick Owen of Brantham Court suggested 100 pairs as the figure for the whole of this estuary. These estimates total some 900 pairs and compare with Ticehurst's figure of about 136 pairs for the same rivers in 1925-27. It is likely that the estimates are on the low side as they take into account only birds seen along the rivers, and do not include birds at nesting-sites, in search of which they went two miles or more inland. It is perhaps worth mentioning that on March 2nd before the breeding season had begun, I counted about 1,150 Sheld-Duck on the Deben between Waldringfield and Woodbridge.

P. A. D. HOLLAM.

BREEDING OF COMMON POCHARD IN MIDDLESEX.

ACCORDING to the *Handbook of British Birds* the Common Pochard (*Aythya ferina*) is not considered to breed in Middlesex. I must therefore record the successful breeding of this species in 1938, 1940 and 1941 at Osterley Park. I have no breeding records for 1939, but in that year Dr. G. Carmichael Low saw two pairs on June 3rd (see *London Bird Reports* for 1938-1940.)

I might mention that the lake at Osterley is especially suitable for the breeding of this duck, having plenty of cover,

reeds, rushes, etc., also some of the smaller trees surrounding the lake have fallen into the water, thus providing further suitable nesting sites. C. A. WHITE.

[The first record of breeding (in 1938) was published after we went to press with Vol. iii of *The Handbook*.—EDS.]

STATUS OF COMMON SCOTER IN SHETLAND.

As *The Handbook of British Birds* gives only three dates for the breeding of the Common Scoter (*Melanitta n. nigra*) in Shetland, the following circumstantial evidence may be worth recording as an indication that breeding there is perhaps more common than is suggested by merely three dates. Whilst on the western mainland for a few days in early July, 1932 I saw on four separate lochs, two pairs and two single ducks of this species. Although I failed to prove nesting, the behaviour of at least one of the ducks strongly suggested it. I might add that on the lochs in the islands of Yell and Unst, where most of my intensive bird work was done, I did not see the species.

G. K. YEATES.

INCREASE IN KITTIWAKES BREEDING IN S. DEVON.

It is perhaps of interest to note the further increase in the colony of Kittiwakes (*Rissa t. tridactyla*) near Berry Head, S. Devon, reported by W. Walmesley White (*antea*, Vol. xxxiv, pp. 112-113). Several counts taken in June and July, 1941 from different positions on the cliffs showed a total of about 225 nests, most of which held well-feathered young on July 6th.

P. A. D. HOLLOM.

LOW NESTING-SITE OF BULLFINCH.—Mr. Hubert E. Pounds writes that on May 29th, 1941, in the Farleigh district of Surrey, he examined a nest of the Bullfinch (*Pyrrhula p. nesa*) containing four eggs which was placed upon a dead oak-branch lying upon the ground in a woodland glade, and well concealed beneath a thick and extensive growth of bramble. The wood itself was composed chiefly of oak, and the site selected not far from the edge. The height of this nest above ground level was seventeen inches, and it was partly supported by bramble tendrils though, on one side, the usual foundation of thin twigs appeared particularly substantial.

GREAT SPOTTED WOODPECKER TAKING YOUNG OF TREE-CREEPER.—Mr. J. B. Watson informs us that on June 17th, 1941 in a wood by Loch Ericht, Inverness-shire he saw a male Great Spotted Woodpecker (*Dryobates m. anglicus*) which was uttering harsh notes and appeared to be much excited, fly on

to the trunk of a dead Scots pine then drop to the ground and peck vigorously at something which it carried to the top of an adjacent post. This he found to be a fledgling Tree-Creeper (*Certhia f. britannica*) which had been taken from a nest made between the bark and trunk of the Scots pine. The species has been previously noted as taking young of House-Martin, Sparrow, Lesser Spotted Woodpecker and tits (cf. *Handbook*, Vol. ii, p. 286).

OSPREY IN CUMBERLAND.—Mr. M. G. Robinson gives us particulars of an Osprey (*Pandion h. haliaetus*) which he saw at Edenhall Lake, near Penrith on April 28th, 1941.

BLACK-NECKED GREBE IN DUMFRIES-SHIRE.—Mr. M. G. Robinson writes that he identified a Black-necked Grebe (*Podiceps n. nigricollis*) at Powfoot, near Annan on February 5th, 1940. The species appears to have been seldom recorded from this county.

BLACK TERNS IN FLINTSHIRE.—Major W. L. Roseveare informs us that he saw two Black Terns (*Chlidonias n. niger*) flying over the shore near Prestatyn on July 4th, 1941. The species is not often recorded from N. Wales.

REVIEW.

Factors affecting the General Status of Wild Geese and Wild Duck. International Wildfowl Inquiry. Volume 1. (Cambridge University Press). 8s. 6d. net.

ALTHOUGH this has been numbered as Volume i it is actually the second report in book form to be published by the British section of this Committee, the first, called Volume ii, having been noticed in our pages last June (*antea*, Vol. xxxiv, p. 22).

The chairman, Dr. Percy R. Lowe, gives in the introduction a history of the events which led to the formation of the Committee and an account of some of the factors responsible for the diminution in the world's stock of wildfowl. There follow chapters on the conditions in northern breeding areas contributed by a number of well-known ornithologists as results of their personal observations, the distribution of *Zostera* by Dr. R. W. Butcher, a specialist on the subject, British decoys by H. A. Gilbert and others, punt-gunning by C. J. Dalgety and others, ringing of duck at British decoys by Dr. A. Landsborough Thomson and C. W. Mackworth Praed, a general survey from all sources of the results of ringing duck by Dr. Thomson and a table of close times by Miss Phyllis Barclay-Smith.

The accounts of northern breeding-grounds do not extend east of Norway and so far as European migratory ducks are concerned it is most important that conditions to the eastward should be known. It is to be hoped that reports from these areas, so essential to an understanding of how best to conserve the numbers of migratory ducks, will some day be forthcoming, otherwise, as it seems to us, the Committee will be working largely in the dark.

The most serious point brought out by the present reports is the wholesale taking of eggs for food of the Pink-footed Goose. The effect of this upon a species with so restricted a range must be serious, as owing to the shortness of the breeding season it is unlikely that it can successfully rear later broods. There seems little doubt, however, that an increase rather than a decrease has been noted in the Pink-footed Goose in winter and an explanation of this in view of the present reports has to be found.

Dr. Butcher's study of the *Zostera*, which as is well-known has diminished seriously in recent years, is very valuable and he appeals to ornithologists for more information as to the exact effect on Swans, Brent Geese and Wigeon, the species chiefly affected, and for more knowledge of alternative foods. Much could be done in this direction by field observation as well as by examination of stomach contents.

The accounts of British duck decoys show that the number of duck now taken is in no way serious, but it is far otherwise with the decoys in Holland and when we are told that at least a million ducks are taken annually in Dutch decoys it becomes evident that this is the most urgent and important point of all that the International Committee will have to consider in the future. It is indeed remarkable that the Dutch, who have done such wonderful work in conserving their own breeding birds, have been unable to control this most glaring example of commercialisation of wild birds in Europe.

The results of ringing of ducks are very well drawn up and bring out many interesting points connected with movements and the accounts also show that much more ringing is necessary.

The tables of close times for the various species of geese and ducks in the countries of Europe and the details and explanations of our own close time in Great Britain are very useful, but curiously enough we are given no information about Ireland!

It can hardly be supposed that the wildfowl population in Europe will do other than deteriorate during the war and these volumes containing the results of the Committee's pre-war labours should prove of great value in future considerations.

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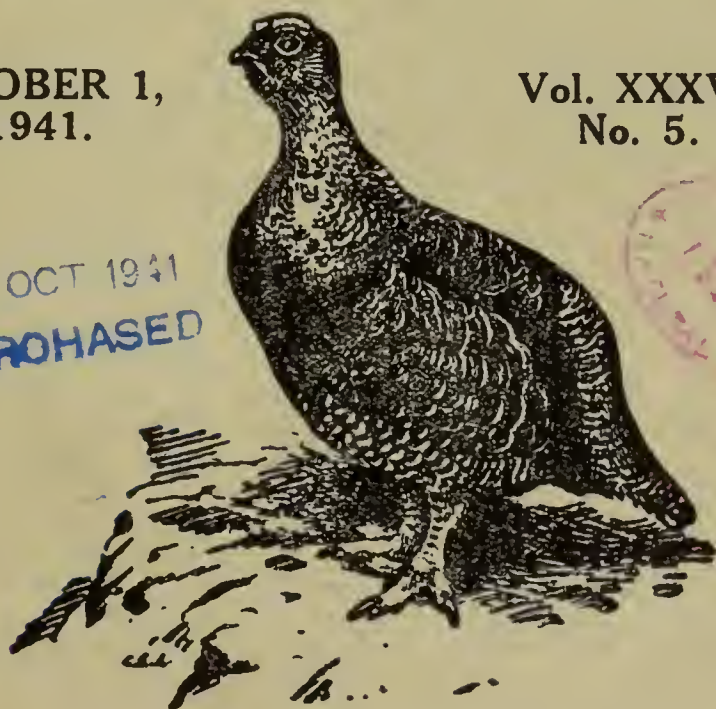
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ASSISTED BY

NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U., AND

BERNARD W. TUCKER, M.A., F.Z.S., M.B.O.U.

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FURTHER DATA ON NEST-SANITATION

BY

B. W. TUCKER, M.A., M.B.O.U.

(Concluded from page 72).

Since the first part was printed, notes on several sea-birds have been received from Mr. R. M. Lockley, whose contributions are indicated by his initials.

SAVI'S WARBLER (*Locustella l. luscinioides*).

Fæces removed by female ; sometimes swallowed, sometimes carried away (G. Schiermann, *Journ. f. Orn.*, 1928, pp. 665, etc.). Swallowing and carrying observed concurrently, even at same feeding visit ; habitually taken as extruded (H. Dirx, *Gerfaut*, 1939, pp. 1-31).

GRASSHOPPER-WARBLER (*Locustella n. nævia*).

Fæces carried (G.K.Y.). Carried by both sexes when young 8-9 days old (G.C.S.I.).

GREAT REED-WARBLER (*Acrocephalus a. arundinaceus*).

Female waited for and swallowed fæces of young 2-3 days old, only occasionally carrying them away when uneasy, but in another case with feathered young fæces were carried. (J. Bussmann, *Orn. Beob.*, xxxix, 1932, pp. 153 and 155).

REED-WARBLER (*Acrocephalus s. scirpaceus*).

Fæcal sac extruded after feeding and carried away or swallowed by one or other of parents (H. E. Howard, *Brit. Warblers*, ii, p. 59). Removed by both parents and dropped at a distance when young were within a day or two of fledging. If young voided droppings during absence of parents these would slip down reeds to remove them after feeding ; this observed about 3 times in c. 90 mins. (G.C.S.I.).

MARSH-WARBLER (*Acrocephalus palustris*).

Defæcation usually after feeding, parents carrying fæces away or swallowing (H. E. Howard, *Brit. Warblers*, ii, p. 124). Carried away from well-grown young (R. Chislett). Carried (G.K.Y.).

SEDGE-WARBLER (*Acrocephalus schænobæus*).

Carried and dropped 20-30 yards away by female, but occasionally swallowed (H. E. Howard, *Brit. Warblers*, ii, p. 153).

BARRED WARBLER (*Sylvia nisoria*).

Removed by both parents, observed 44 times by male and 33 by female ; swallowing (male and female) twice observed (O. Steinfatt, *Orn. Beob.*, xxxv, p. 124).

GARDEN-WARBLER (*Sylvia borin*).

Fæces carried away for some distance and dropped by both parents (H. E. Howard, *Brit. Warblers*, i, pp. 100, 101). Carried (G.K.Y.).

LESSER WHITETHROAT (*Sylvia c. curruca*).

Removed by parents (H. W. Ford-Lindsay, *Brit. B.*, iv, p. 210); carried away (H. E. Howard, *Brit. Warblers*, i, p. 31). At first swallowed, afterwards carried away (G. Niethammer, *Handb. deutsch. Vogelkunde*, i, p. 352). Carried by both sexes and nest kept clean throughout; prodding observed and shown in photograph (E.J.H.).



LESSER WHITETHROAT.

Female prodding young as stimulus to defæcation.
(Photographed by E. J. Hosking.)

SUBALPINE WARBLER (*Sylvia c. cantillans*).

Carrying by male observed (G.K.Y.).

DARTFORD WARBLER (*Sylvia undata dartfordiensis*).

Fæces removed from nest (P. F. Bunyard, *Brit. B.*, vii, p. 217). Swallowing observed; chicks fully fledged (G.K.Y.).

FIELDFARE (*Turdus pilaris*).

Swallowed (A. Fritsch, *Orn. Jahrb.*, iii, 1892, p. 19). Swallowed by both sexes (H. Bentham, *Brit. B.*, v. p. 130).

ICELAND REDWING (*Turdus musicus coburni*).

Fæces regularly swallowed by parents after feeding (G. Timmermann, *Journ. f. Orn.*, 1934, p. 322).

BLACK REDSTART (*Phænicurus ochrurus gibraltariensis*).

Nest kept clean apparently by female alone (A. Comte, *Bull. Soc. Zool. Genève*, iii, 1928, p. 22).

NIGHTINGALE (*Luscinia m. megarhyncha*).

Both parents waited after feeding to remove excrement (J. K. Stanford, *Brit. B.*, xiii, p. 170). Fæces removed by both sexes. When young are small they are extracted from bottom of nest and swallowed; from 6th day on they are taken from edge of nest or direct from cloaca and either swallowed or carried away and dropped (N. F. Ticehurst, *t.c.*, vi, p. 175). Normally swallowed at nest at all ages; once seen carried. Deliberately awaited after each feed; male most particular (G.K.Y.).

THRUSH-NIGHTINGALE (*Luscinia luscinia*).

About every third feeding during earlier observations (June 11th), but later (June 16th) about every fourth, nestling which had been fed passed an encapsuled faecal pellet, which was taken by parent as extruded or immediately after and in first days swallowed, but later carried away in bill (O. Steinfatt, *Orn. Monatsb.*, 1939, p. 43).

RED-SPOTTED BLUETHROAT (*Luscinia s. svecica*).

Cleaning nest special duty of male (R. Chislett, *Northward Ho for Birds*, p. 156).

ALPINE ACCENTOR (*Prunella c. collaris*).

Female seen carrying fæces in bill from nest (F.C.R.J.).

ALPINE SWIFT (*Apus m. melba*).

At first fæces are swallowed by parents, but later evacuated over side of nest (M. Bloesch, *Orn. Beob.*, xxix, 1932, p. 156). Deposited on side of nest (M. Bartels, *Journ. f. Orn.*, 1931, p. 21).

HOOPOE (*Upupa e. epops*).

Amongst southern peoples the Hoopoe has been notorious for filthy nesting habits at least from classical times (*cf.* D'Arcy Thompson, *A Glossary of Greek Birds*, pp. 96-7) and doubtless earlier, and in modern works on ornithology the nesting-hole is usually stated to be in a very offensive condition owing to accumulation of fæces. This is certainly sometimes the case, but there is evidently considerable variability in behaviour. Naumann many years ago gave an account of what has been widely regarded as the typical condition of a

Hoopoe's nest, which he described as a stinking sewer in which the young sit up to their necks in their own excrement, which, becoming putrid, gives off a nauseating smell, "though sometimes it has some similarity to that of large ants" ("Neuer Naumann," iv, pp. 386-7). This lurid description is probably exaggerated or based on an exceptional case, but in more recent years A. Wiedemann (*Bericht d. naturw. Ver. f. Schwalben und Neuberg*, 1890, p. 35) and H. Dorning (*Köcsag*, 1930, p. 15)* have recorded non-removal of fæces and B. Wigger (*Jahresber. d. Westfälischen Provinzial-Vereins*, 1905-6, p. 128) describes accumulation of fæces in a corner of the hole. On the other hand a number of other observers in recent years have described a more or less effective sanitation entailing both the direct discharge of fæces from the hole by the young and a certain amount of active removal by the parents. In a nest carefully watched by O. Heinroth (*Vögel Mitteleuropas*, i, p. 294) no removal of fæces was observed, the old birds being very shy, but as the young grew older they evacuated out of the mouth of the hole, so that the white flecks remained for a long time visible on the trunk below. After fledging the interior of the hole was found to be absolutely clean. Again, J. Bussmann (*Orn. Beob.*, xxxii, 1934, p. 19) describes ejection of fæces 15-25 cms. from the hole by the young, and K. Witte (*Orn. Monatsb.*, 1926, p. 20) records a heap of fæcal matter outside a hole. E. Puhlmann (*Orn. Monatsschr.*, 1912, p. 430) and K. Wurga (*Aquila*, xxx-i, 1923-4, p. 329) record actual removal of fæces by the parents. Wurga records a case where the young were fed for half an hour or an hour and the parent then devoted itself to removal of excrement. On one occasion it stayed three minutes in the hole and then eleven times brought up fæces in the bill. Amongst the most careful recent observations are those of G. Stein (*Beit. Fortpfl.-biol. Vög.*, 1928, pp. 198-9), who studied several nests. He found the inside of the nest-hole generally comparatively dry and clean and a large accumulation of droppings at the foot of the tree. In two cases such accumulations were absent. Yet the interior of the hole in these instances was quite dry and clean. In another case the bottom of the hole was covered with a deep layer of fæcal matter in a moist

* Dorning describes breeding of Hoopoes under peculiar conditions, namely in the lofts of buildings in the Hungarian vineyards, where the eggs are laid on the bare floor. He states that the surroundings become very dirty and evil-smelling, but when the young have grown rather larger they leave their regular nesting place in order to evacuate at some distance from this site, with the cloaca directed away from it.

and crumbling condition and giving off a sharp ammoniacal smell. The young, however, merely rested on this layer and were not befouled with it in the way described by Naumann. One removed and examined shortly before fledging was quite clean and did not smell offensively. Another recent observer, O. Wilhelm (12. *Jahresber.* 1938-39 d. *Vogelkundlichen Beobachtungsstation 'Untermain'*), also found the nest-hole quite clean and almost without smell.

It may be concluded, therefore, that although sanitation of the Hoopoe's nest is apt to be defective popular ideas on the subject are much exaggerated.

ROLLER (*Coracias g. garrulus*).

No removal of fæces observed; hole filthy and young 17-20 days old covered with fæces (O. Steinfatt, *Beit. Fortpfl.-biol. Vög.*, 1934, p. 222). This observation confirms the much earlier account of Naumann ("Neuer Naumann," iv. p. 369).

YELLOW-BILLED CUCKOO (*Coccyzus a. americanus*).

Young backs up to edge of nest to defæcate (L. H. Walkinshaw in Bent, *Life Hist. N. Amer. Cuckoos*, etc., Bull. 176, U.S. Nat. Mus.).

EAGLE-OWL (*Bubo b. bubo*).

Heinroth (*Vögel Mitteleuropas*, ii, p. 30) states with reference to three young reared in captivity that in order to evacuate they moved backwards, but usually fouled the edge of their artificial nest. The old Buzzard's nest from which they were originally taken was also not kept clean.

LITTLE OWL (*Athene n. noctua*).

With reference to birds of the race indicated, Heinroth (*Vögel Mitteleuropas*, ii, p. 15) states that in the nest the young evacuate as far as possible upwards and outwards, after the fashion of Passerine birds, but gives no further information.

SHORT-EARED OWL (*Asio f. flammeus*).

F. Groebbels (*Der Vogel*, ii, p. 406) quotes Hennings as the authority for the observation that the female swallows the fæces of the young. No reference is given, and as I can trace none in the *Zoological Record* the statement may be based on a private communication, but in a paper by Hennings on the Hen-Harrier I find it mentioned (*Beit. Fortpfl.-biol. Vög.*, 1936, p. 158) that the Short-eared Owl swallows the *pellets* of its nestlings. This statement by Groebbels is thus possibly an error and requires confirmation, though even the swallowing of pellets is of considerable interest. J. Walpole-Bond (*Feld-*

Studies of some rarer British Birds, p. 130) describes a nest with young c. 13-18 days old as "befouled and trampled" and C. A. Urner (*Auk.*, 1925, p. 34) describes one containing five young as "filthy with excrement." The few nests with young I have seen have not been conspicuously dirty.

HOBBY (*Falco s. subbuteo*).

Evacuation over edge of nest from beginning of observation, when young were 12 days old (G.K.Y.).

GOLDEN EAGLE (*Aquila ch. chrysaëtus*).

Evacuation over edge of nest. H. B. Macpherson (*Home Life of Golden Eagle*, pp. 17, 26, 32) records female removing fouled and dirty sticks and heather from the nest and clearing away pellets and carcasses, generally at dawn.

HEN-HARRIER (*Circus c. cyaneus*).

S. Wesslén (*Träskets aristokrater*, Stockholm, 1930) states that pellets of nestlings are at first swallowed by the adults. H. Hennings (*Beit. Fortpfl.-biol. Vög.*, 1936, pp. 105-113, 150-160, esp. summary, p. 158) did not observe this, but found that they were regularly carried away and dropped after feeding. The nestlings did not produce pellets during the first 14 days.

AMERICAN GOSHAWK (*Accipiter gentilis atricapillus*).

Fæces discharged clear of nest (J. B. and R. E. Dixon, *Condor*, xl, p. 10); ejected high over edge of nest, very little on rim and interior quite clean, but ground below much "white-washed" (O. J. Gromme, *Auk.*, 1935, p. 17). The descriptions are doubtless equally applicable to the European form.

KITE (*Milvus m. milvus*).

Photograph of young ejecting fæces over side of nest (G. Thiede and A. Zänkert, *Beit. Fortpfl.-biol. Vög.*, 1935, p. 10).

HONEY-BUZZARD (*Pernis a. apivorus*).

Fæces discharged over side of nest, but very little trace on ground below; probably defæcates less often than other Raptores (W. Wendland, *Journ. f. Orn.*, 1935, p. 98).

GRIFFON-VULTURE (*Gyps f. fulvus*).

Photograph of nestling evacuating in typical manner of birds-of-prey (Heinroth, *Vögel Mitteleuropas*, ii, pl. 137, fig. 7); nest ledge with large young remarkably clean (F.C.R.J.).

WHITE STORK (*Ciconia c. ciconia*).

Fæces ejected over side of nest at least in later stages (H. Siewert, *Die Störche*, p. 175, photo).

BLACK STORK (*Ciconia nigra*).

Fæces ejected over side of nest (H. Siewert, *t.c.*, p. 95, photo of young in position), but parent also seen to take fæces direct from cloaca of young and swallow (F. E. Stoll, *Ardea*, 1934, p. 53).

SPOONBILL (*Platalea l. leucorodia*).

Nest becomes a mass of excrement (F.C.R.J.).

GREAT WHITE HERON (*Egretta a. alba*).

Nest remarkably clean, in contrast to Spoonbill (F.C.R.J.).

NIGHT-HERON (*Nycticorax n. nycticorax*).

Fæces voided over edge of nest (F.C.R.J.).

LITTLE BITTERN (*Ixobrychus m. minutus*).

Young nestlings cling to edge of nest with feet and lower body over the edge to evacuate clear of nest. When about ten days old they leave nest to defæcate, but return to it (F. v. Lucanus, *Journ. f. Orn.*, 1914, p. 51).

AMERICAN BITTERN (*Botaurus lentiginosus*).

Nest becomes unpleasantly smelly (I. N. Gabrielson in Bent, *Life Hist. N. Amer. Marsh Birds*, Bull. 135, U.S. Nat. Mus., p. 77).

GANNET (*Sula bassana*).

R.M.L. writes : " As far as I remember, the young Gannet, when newly hatched, squirts its waste with scarcely a lift of the tail, as it is, of course, very helpless in the first few days. Later, as it grows, it squirts it after a slight raising of the tail, usually resulting in fouling the rim of the nest, or when big enough, just clear of this. But it is neither a violent squirt nor often above the horizontal and so does not travel far, seldom so far as to foul the neighbouring nest." The net result, however, is that the nesting ground as a whole is in a very insanitary condition, though rain and the nature of the site mitigate the effects to some extent.

STORM-PETREL (*Hydrobates pelagicus*).MANX SHEARWATER (*Puffinus p. puffinus*).

As the young of both these species are fed on predigested food the nests are very clean. The waste is chiefly liquid and is absorbed by the walls of the nest burrow, from which the chick does not move (R.M.L.).

FULMAR (*Fulmarus glacialis*).

Excrement of chick (also of adult) ejected to astonishing distance ; nest-site clean (E. Selous, *Bird Watcher in Shetlands*, p. 93). Chick turns round from facing sea to facing cliff before

ejecting excrement clear of nest ledge (R. Perry, *At the Turn of the Tide*, p. 160).

TURTLE-DOVE (*Streptopelia t. turtur*).

Fæces not removed (H. W. Ford-Lindsay, *Brit. B.*, v, p. 210); nest in filthy condition towards end of fledging period (G. C. S. Ingram and H. M. Salmon, *Birds in Britain to-day*, p. 98).

KITTIWAKE (*Rissa t. tridactyla*).

Nestling backs to edge of nest and discharges fæces over the edge for as much as four or five feet (R. Perry, *Lundy, Isle of Puffins*, p. 103). In spite of this the nests become very much fouled with droppings on the outside. Recorded observations as to how this comes about seem to be lacking. Perhaps the incubating adults are responsible, but the supposedly adaptive behaviour of the nestling seems thereby to be largely defeated.

PUFFIN (*Fratercula arctica grabæ*).

As food is not predigested young pass much excrement and burrow becomes very foul, but later, without leaving burrow, the young back to entrance and eject fæces with considerable force, producing a semi-circle of guano outside the hole. (R.M.L., *Brit. B.*, vol. xxvii, p. 221).

OBSERVATIONS ON THE SINGING OF THE CHAFFINCH

BY

D. S. FALCONER.

THE spring of 1935 offered me an opportunity for close observation of two pairs of Chaffinches (*Fringilla c. cœlebs*), occupying neighbouring territories in a garden at Leysin (Canton de Vaud), Switzerland. This paper records some of the more interesting observations made, most of which were suggested by the section on bird-song in *The Art of Bird Watching* (Nicholson, 1931).

The two cocks were distinguished by locality of singing and (up till March 19th) by differences in the song. The observations, unless otherwise stated, relate only to one of these cocks. The amount of song was estimated chiefly by general impressions, but during one week more accurate estimation was made by counting the number of songs in a two or three minute period once or twice in each half-hour, and noting for how long the bird sang in the half-hour. This method gave an error of only 3% when compared with an actual count over one half-hour period, and may therefore be considered reasonably accurate.

THE SONG PERIOD.

Commencement.—The first attempts at song were heard on February 12th. These were very faint noises having no resemblance to the perfected song, but resembling rather closely the sub-song. After three days the form of the perfect song could be recognized, and eight days after the beginning the songs were almost up to full strength, though the form was still very varied. Bechstein (1795) gives four weeks as the trial period in caged Chaffinches before the song is fully perfected.

Variation in the daily amount of song.—The daily amount of song was largely influenced by weather conditions, but there was evidently an underlying seasonal rhythm. Thus, the first day on which attempts at song were heard was the first sunny and comparatively warm day after some weeks of dull and cold weather. After a week the weather became bad again, but the singing did not stop, though it certainly did not increase. Fine weather returned on March 12th and the amount of song rose rapidly to a maximum on March 15th, for which day I estimated a total of about 2,000 songs. The daily amount of song continued on a high level though falling off somewhat till two days of bad weather occurred on March 23rd and 24th, on which days there was very little

song. Fine weather from March 25th onward showed a certain increase in the amount of song, but it never again reached a high level even on the finest days. On two exceptionally bad days there was no song at all.

Hour of commencement of singing.—Observations of this are unfortunately limited, but as far as they go they show considerable regularity. They are given in Table I. The time of “real” sunrise refers to the district in general and was observed as the time when the sun first shone on the peaks. “Local” sunrise refers to the time when the sun first shone on the bird’s territory. Owing to the slope of the shadowing mountain this became progressively nearer to the time of “real” sunrise.

TABLE I

Date	Time of sunrise		Time of first song.	Minutes before sunrise		Weather
	“real”	“local”		“real”	“local”	
March 14	6.50	7.40	6.37	13	63	Fine
“ 15	(6.49)	7.37	6.37	(14)	60	“
“ 16	(6.48)	7.33	6.30	(18)	63	“
“ 17	(6.47)	(7.28)	6.31	(16)	(57)	Cloudy
“ 18	(6.46)	(7.24)	6.32	(14)	(52)	“
“ 19	6.45	7.20	6.22	23	58	Fine
“ 22	6.41	7.15	6.15	26	60	“
“ 26	(6.37)	c.7.00	6.10	(27)	c.60	“
“ 29	(6.34)	6.45	6.15	(19)	30	Dull, cold.

Table showing the relationship of the time of starting to sing and the time of sunrise. For explanation see text.

Figures in brackets were not directly observed, and are derived by interpolation. The times are Central European Time.

If the time of starting to sing is governed by the intensity of the light we must compare it with the time of “real” sunrise, for this obviously controls the general sky light. This comparison is given in column 5 of the above table, and shows the singing to become progressively earlier, thus agreeing with the observations of Burkitt (1935) and of Clark (1938). On the other hand, comparison with the time of “local” sunrise shows no progressive change (column 6). This is probably a coincidence, as it is difficult to see how the “local” sunrise could influence any factor perceptible to the Chaffinch. On cloudy days singing is seen to start somewhat later than on fine days. Unfortunately no observations of temperature were made, but it seems probable that temperature is not of great importance in this respect (Alford, 1925).

Variation in amount of song during the day.—There was a clear daily rhythm in the singing activity, and this rhythm altered as the season progressed. All the singing was confined to the forenoon, for though occasional songs were heard in the afternoon, this could not be called singing. There was never any singing in the evening, which contrasts strongly with the observations of Burkitt (1935) for Northern Ireland. Starting before sunrise, the amount of song increased to a maximum during the morning and then fell off to nothing by about midday. During the early part of the season, up to mid-March, the peak occurred about 9.00 or 10.00 a.m., but after that the singing became progressively earlier in the day, the peak occurring before 8.00 a.m. Moreover, the time devoted to singing became shorter and shorter, so that in the later part of the season singing was confined to about half an hour in the early morning.

Unfortunately observations became increasingly scanty as the singing became earlier, and I have no note of the date when singing ceased.

This daily rhythm was apparently not affected by minor fluctuations in the weather. For example, a warm and fine afternoon following a cold and dull morning did not induce any afternoon singing. Nor did a period of sunshine during a dull day appreciably increase the singing activity.

THE SONG.

Rate of singing.—The singing of the Chaffinch consists of a periodic repetition of a more or less stereotyped "song." The song and its differences in different individuals have been well described by Bechstein (1795 and 1871), and more recently by Promptoff (1930). But little attention has been paid to the interval between the songs, except by Nicholson and Koch (1936) where the striking regularity of most birds' singing is stressed.

The observations I made are as follows. When the intervals between the beginnings of successive songs were timed, they were found to vary by as much as 100%. Thus three typical series of intervals were, in seconds, 7, 7, 5, 8, and 5, 5, 8, 8, 4, 5 and 4, 6, 6, 6, 5, 4, 8. But it will be noticed that a short interval is in general compensated by a long one following, and *vice versa*. If this variation is smoothed by counting the number of songs per minute, very considerable regularity was found over periods up to 10 or 15 minutes.

But, though constant over short periods, the rate of singing varied widely during the day. The highest rate recorded was 13 songs per minute, but 10 was a common figure during a

period of singing. The rate fell off to about 4 songs per minute before the singing lost its regularity and passed into "occasional songs." Nicholson and Koch (1936) give 5-9 songs per minute as the usual rate.

Thus it is the variation in the rate of singing which gave rise to the variation of the singing activity throughout the day, described in the last section.

It was not often that a period of singing lasted for half an hour without a break, but at the peak of the daily singing it often lasted longer with only short breaks of 2 or 3 minutes.

Analysis of songs: individual variation.—So characteristic is the song of the Chaffinch that it cannot easily be mistaken for that of any other bird, and without a close study it seems to be quite invariable. Yet closer study shows considerable variation in the same bird and between different birds. Bechstein (1795) describes 18 varieties of song in caged Chaffinches (raised to 20 in the 1871 edition!), and Promptoff (1930) shows the possibility of a very large number of distinct types by the combination of different varying characters.

For purposes of description each song is divided into a number of phrases and an ending. Each phrase (German "Strophe") consists of several notes and is separated from the next phrase not by an interval but by a difference in the character of the notes. The ending ("Ausfall") contains the characteristic falling "British Museum" note. Figure 1 shows four varieties of the song, using the notation suggested by Rowan (1924). A \cup indicates an unaccented note, and a — indicates an accented note. The pitch of the notes is indicated by the level on which they are written, and the length of the note by the length of the mark: \cup or \cup ; — or —.

The songs given by the two birds under observation varied in the following ways.

- (1) There were always three phrases and an ending (in the completed song).
- (2) The number of notes in each phrase varied from about 3 to about 6.
- (3) There was a sharp division into two types by the character of the second phrase. In the first type (*b* and *c* in fig. 1) the notes were distinct, and intermediate in pitch between the first and third phrases. In the second type (*a* and *d*) the second phrase consisted of what sounded like a single long accented note, but which may in reality have been a succession of very rapid notes forming a "trill."

- (4) In this latter type of 2nd phrase, the pitch could be high (*d*) or low (*a*).
- (5) The ending showed also two distinct types. It could have the stress on the penultimate high note (*c* and *d*), or on the final low note (*a* and *b*).
- (6) The two distinct types of 2nd phrase and of ending could be combined in any way, giving the four types shown in the figure.

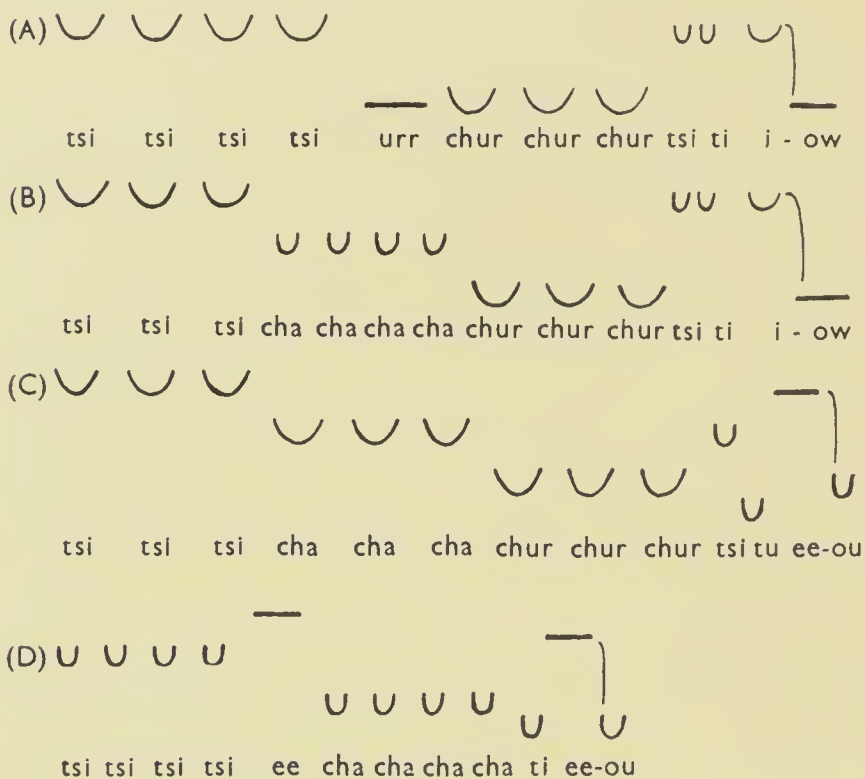


Fig. 1. The four main types of song heard. Each rendering separately is approximately correct quantitatively, but no quantitative comparison can be made between the separate renderings. The duration of (*a*) was 2.8 secs. and of (*d*) 2.0 secs.; that of the others is not known.

- (7) Often a song was incomplete. Omission of the ending was frequent at the beginning of the season, but this cannot be classed as a variety as it was not constant in either of the birds. Occasionally, after a short first part, two endings were given.

During the first part of the season (up to mid-March) the songs given by the two birds under observation were quite distinct in type. One used only the combination of second phrase and ending shown in (*b*). The other used only that

shown in (*d*). Then, however, the first bird could often be heard to use the other type of 2nd phrase, though retaining his own ending (as in *a*). While, at the same time the second bird often used the first type of 2nd phrase, retaining his own ending (as in *d*). As these two birds occupied neighbouring territories, it seems probable that each borrowed from the song of his neighbour by imitation. Observations, unfortunately, do not indicate whether this borrowing extended also to the types of endings or to the less obvious variations.

Further remarks on the singing.—During a period of singing the bird moved about frequently: five minutes would be a very long time to spend on one perch. The perch appeared to be chosen at random; that is to say, the place of alighting was the place of singing. It was noticeable, however, that a conspicuous perch such as the top of a tree, was very seldom chosen. Often, particularly toward the end of the daily song period, singing and feeding took place together, in which case the rate of singing was reduced to about 5 songs per minute, and the songs were uttered from the place of feeding, even when on the ground. Singing while on the wing occurred occasionally.

The relation of song to territory was obscure. Singing was well established by February 20th, but the first signs of territorial disputes were not seen till March 13th. Disputes over territory were never preceded nor followed by song, the call used being the common "*pink*". On one occasion, not even a strange male singing in my bird's favourite tree spurred him to song! Evidence of two birds answering each other is difficult to obtain owing to the constancy of the rate of singing, and no satisfactory observations were made.

THE SUB-SONG.

The sub-song was only occasionally heard in the morning, its usual hours being between 2 and 5 p.m. In form it was very varied and sounded "improvised"—that is to say not stereotyped. Normally it consisted of a variety of gentle chirps uttered without opening the beak (in contrast to the real song) but often very quiet renderings of the real song were heard, as if from a bird much further away. Sometimes it would give way to a full or almost full song. At one time, when Coal-Tits had been very numerous and noisy it contained very excellent imitations of their call. While giving the sub-song the bird was invariably quiet and very inconspicuous, in contrast to its behaviour while giving the real song.

SUMMARY.

1. The song was perfected only after a trial period lasting fully a week.
2. The daily amount of song varied to a large extent with the weather.
3. Exclusive of weather effects there was an underlying seasonal rhythm. The peak coincided with a period of fine weather, after which the amount of song fell off much in spite of continued fine weather.
4. The hour of starting to sing showed considerable regularity, and became progressively earlier relative to the time of sunrise, as the season advanced. In the middle of March it was about 15 minutes, and at the end of March, 30 minutes before sunrise.
5. There was a clear daily rhythm in the singing activity, the peak becoming progressively earlier, and the period of singing becoming progressively shorter as the season advanced.
6. There was no singing in the afternoons or evenings.
7. The daily rhythm was apparently not affected by changes in the weather during the day.
8. Thirteen songs per minute was the highest rate recorded, and 10 was a common figure.
9. The songs of the two birds observed consisted of three phrases and an ending.
10. The chief variations were in the 2nd phrase and in the ending.
11. The two birds were at first distinct in the types of song they used, but later each "borrowed" from the other.

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OBITUARY.

JOHN MICHAEL DEWAR.

(1883-1941).

IT is with much regret that we have to record the death of Dr. John Michael Dewar, which took place on May 24th, 1941, at the comparatively early age of fifty-eight. Dewar was a meticulously careful and markedly original observer and is best known to ornithologists for his work on diving birds and for his very full and exact field-studies of the feeding habits of several waders. His book *The Bird as a Diver*, published in 1924, is the standard work on the subject and was the product of prolonged and intensive field observation, as may be gathered from the fact that his conclusions were based on the timing of nearly six thousand dives of twenty-three species in known depths of water. His studies led him to the conclusion that depth is the principal factor determining length of dive, the time-depth relation being expressed by his "20-10 second rule" (20 seconds for the first fathom and 10 for every fathom after), and he showed that the application of a technical formula, that of an autocatalytic chemical reaction, gave an even closer approximation to the average times actually observed at known depths. In his later writings, however, he referred only to the 20-10 seconds rule, probably because of its greater simplicity and intelligibility to laymen and because he considered it adequate for all practical purposes. Exceptions to and deviations from the rule are possibly more widespread than Dewar believed, but no other student has contributed so much to our better understanding of the activities of diving birds and his work remains a contribution of outstanding merit to the sciences of ornithology and biology. His studies of the feeding behaviour of the Oyster-catcher (*Zool.*, 1908, 1910, 1913) and Dunlin (*t.c.*, 1909) are excellent illustrations of the effect with which his powers of observation were brought to bear on things which less enquiring minds would have passed over as commonplace. He had paid a great deal of attention to the Oyster-catcher and was the author of a long and detailed paper on the relation of the species to its environment in the *Zoologist* for 1915 and of an instructive study in the present journal (*antea*, Vol. xiii) of the progress of the individual towards maturity, dealing with the development of the various reactions of the young bird. Readers of *British Birds* will also recall his recent interesting communication on the

identity of the specialized feeding habits of Turnstone and Oyster-catcher. He was also the author of discussions in the *Zoologist* of the evolutions of waders (1912) and the sense of direction in birds (1915) and of various shorter papers and notes in the ornithological and natural history journals. Nearly all of them bore witness to the activity and originality of his mind, an excellent example amongst his shorter communications being his ingenious and almost certainly correct demonstration of how the Dipper progresses under water (*antea*, Vol. xxxii). His intense desire for absolute accuracy and fear of publishing anything which might prove in after years to be wrong led him to conserve his output of published work, but in private he was a voluminous writer as well as a great reader. He devoted much time and care to the abstracting of ornithological notes and papers in both English and foreign languages, and his sister informs us that he was able to cope even with Russian. We learn that at the time of his death he had ready for publication a large work of reference entitled a *Dictionary of the Habits and Behaviour of Birds*.

Dewar was educated at George Watson's College and Edinburgh University and graduated M.B., Ch.B. in 1904. He obtained the degree of M.D. with high commendation in 1914. He was a Fellow of the Royal College of Physicians, as well as a Fellow of the Royal Society of Edinburgh, to which he was elected in recognition of the merits of his book, *The Bird as a Diver*. He was Civilian Medical Officer to the Royal Air Force and since the outbreak of war a temporary Assistant Physician at the Edinburgh Royal Infirmary. He may be said literally to have died in harness, as though not in robust health he refused to give in until it was too late to save his life, and both the medical profession and the science of ornithology are the poorer for the loss of a devoted servant.

B.W.T.

NOTES

DISPLAY IN BLACKBIRDS.

I HAVE a note on communal display in Blackbirds (*Turdus m. merula*) which bears points of similarity to that observed by H. L. Lack (*antea*, p. 54.)

The note reads " March 8th, 1938. An interesting gathering of male Blackbirds took place in the garden as dusk was falling. There were four males (no hens present or within sight), strung out in single file with two or three feet separating each bird. With tightened plumage, head, neck and bill pointing stiffly up at about 45 degrees to the horizontal, tail depressed and spread, one bird would run along a few feet with quick mincing steps, each foot alternately—not hopping. Immediately each bird behind followed suit with precisely the same actions.

There was not in any sense a definite leader, but sometimes one of the following birds would run a few steps past the first bird, when the whole business was repeated with the new bird in the lead.

The display lasted for seven or eight minutes, the birds moving continuously over the same ground—a few square yards of fairly short grass—in a roughly circular course, but this may have been because the tournament ground lay in the angle formed by a fence and hedge.

There was no animosity during the period of display, but on dispersal one bird flew on to a fence and dropped down on to another on the ground in a momentary scuffle. These two then ran after each other again in the original manner for a short period."

Both before and since this occasion I have had momentary glimpses of similar displays, but it is naturally only on rare occasions that one can watch undisturbed birds during the complete cycle of display.

JACK STATON.

DISPLAY OF HEDGE-SPARROW AND FEMALE SINGING.

ON May 10th, 1941, at 8.15 p.m. G.M.T., I watched a pair of Hedge-Sparrows (*Prunella m. occidentalis*) displaying in a wood near Carnforth, Lancs.

The male was singing his "regular" subsong while moving round the female which was answering with a four-note phrase "Chi-choo-chi-choo" in pitch and interval distinctly reminiscent of a chiming clock and at the same time shuffling

her wings and depressing her tail. Though I watched for some 15 minutes I saw no attempt at coition, the male eventually losing all interest in the performance.

This is the first time I have ever heard the female Hedge-Sparrow attempt to sing, nor is there any mention of it in the *Handbook*.

JOHN C. S. ELLIS.

THE FEEDING INTERVAL IN THE HOOPOE.

As is well-known, the female Hoopoe (*Upupa e. epops*) while incubating is fed by the male. I photographed a pair of these



HOOPOE (*Upupa e. epops*); Cock with crest raised a moment after feeding the incubating female.
(Photographed by G. K. Yeates).

birds at the nest during the incubation period in Provence in late April 1937, and recorded the feeding interval for a period of ten days. Observations were not consecutive, but were made at all times of day for stretches of about three hours. With great regularity it appears that the male feeds the female three times in every hour. His visits may be close together (shortest interval, 10 minutes), but they rarely exceeded 40 minutes. If they did so, as on occasion happened at my nest owing to human interference (it was by a small railway station), the female became very impatient, expressing her indignation in a series of harsh, swearing notes not unlike the chorus of young Green Woodpeckers (*Picus viridis*), but less hurriedly delivered. This became more insistent and strident the longer the male was absent. If he was away for more than 50 minutes, the female would leave the nest, returning within a few minutes. In the meantime she had presumably fed, but I could not see this.

Feeding is completed in a flash. As the male arrives at the perch, the female's bill just protrudes from the hole, and the food is handed over in silence. The male frequently raises his crest at the moment of delivery, but he never lingers for a second longer than necessary.

On one occasion a stoat (*Mustela erminea*) climbed the tree and sat in the mouth of the hole with his fore-feet on the male's perch. The female, at the time sitting within, made no sign, nor did the stoat seem to scent her. G. K. YEATES.

BREEDING OF COMMON POCHARD IN MIDDLESEX.

IN regard to the breeding of the Common Pochard (*Aythya ferina*) at Osterley Park, Middlesex (*antea*, Vol. xxxv, pp. 85-6) I must point out that this species bred successfully at Gunnersbury Park in 1931 and at Osterley Park in 1932 as recorded in *A History of the Birds of Middlesex*, which was published in 1935. I cannot say what happened between 1932 and 1938, the first year of breeding given by Mr. White, as my notes and books are now in a depository but it is probable that the species has nested annually at Osterley Park since 1932. WILLIAM E. GLEGG.

[The records mentioned by Mr. Glegg were taken into consideration in compiling the section in *The Handbook*, but there was no evidence then of regular breeding and Middlesex had to be placed among counties where the bird had bred sporadically.—EDS.]

BREEDING OF THE CORMORANT AND SHAG IN CUMBERLAND.

IN view of the fact that in the *Handbook* (Vol. iv) under Cormorant (*Phalacrocorax c. carbo*) it is stated "Absent as a regular breeding bird between Cheshire and the Solway," and that the Shag (*Ph. a. aristotelis*) is described as not breeding in N.W. England, it may be noteworthy to mention that on May 28th, 1941 we observed both these species nesting on St. Bees Head, Cumberland.

Both species seemed to be nesting on one portion of the cliff (north head) and approximate numbers of the birds would be, not more than ten nesting pairs of Shags, and under fifty nesting pairs of Cormorants. Local inhabitants told us that both species nest there every year.

J. F. STIRLING & G. K. ROBINSON.

BLACK-TAILED GODWIT BREEDING IN LINCOLNSHIRE.

As already described (*antea*, Vol. xxxiv, pp. 89-90) I found a



BLACK-TAILED GODWIT; One of the parents on July 5th, 1941.
pair of Black-tailed Godwits (*Limosa l. limosa*) nesting in Lincolnshire in 1940 and saw the birds there in 1939.

This year (1941) they bred again in the same place and whereas last year I was unable to make certain that the eggs hatched, this year I had the satisfaction of seeing the young.

For various reasons I was able to visit the place on four occasions only. On May 14th, when I approached the area where I supposed the nest might be one bird rose from the ground and flew towards me calling excitedly. After circling



BLACK-TAILED GODWIT ; One of the young on July 5th, 1941.

round for a minute or so it returned to the other bird, which had been standing still about 200 yards away. When they were together on the ground they kept quite silent and it was only when they were fully 100 yards apart that they called and this note was quieter and lower in pitch than that made in flight. On this occasion I did not find the nest.

My next visit was on May 25th in heavy rain and I had difficulty in putting up the male and when he did rise he flew low down and circled the nesting area at a distance of about 200 yards. He made only weak calls, which the hen could not have heard in the heavy rain so I decided to walk into the nesting area in the hopes of putting her up. This I did and

she got up, but not until I was within 10 yards of the nest. This was a slight depression moulded round with grasses and contained four eggs. It was within 50 yards of last year's site. As the eggs were lying in water I feared this might have bad results so I hurried away and the bird returned almost immediately. On June 15th I visited the Godwits again and when both birds came screaming towards me I felt relieved as it was evident that they had young. I found one of them which was about the size of a newly hatched chicken and had ridiculously long legs. The parents had led the young about 200 yards from the nest to a drier part. On July 5th I found the young about a quarter of a mile from the nesting place in a part where the grass was much shorter. It would appear that the old birds move them to grass only sufficiently high to cover them when squatting, for when walking about they were clearly visible and I counted three with the aid of binoculars. When alarmed they took cover in the long grass at dyke verges. The parents at times flew within ten yards of me in their anxiety.

W. S. GUNTON.

TURNSTONE IN HERTFORDSHIRE.

I HAVE to-day (August 29th, 1941) had good views of a Turnstone (*Arenaria i. interpres*) at Startop's End Reservoir, Tring. I was told that it arrived yesterday—a day of strong westerly winds. There are few records of this species at the Reservoirs—apparently only four, viz.: Sept. 4th, 1928; May 26th, 1934; August 15th, 1937 and May 21st, 1938.

CYRIL E. MARTIN.

LESSER WHITETHROAT SINGING AT NIGHT.—We are informed by Miss S. M. Butlin that on May 29th, 1941, she heard a Lesser Whitethroat (*Sylvia c. curruca*) give a full-length song-rattle at 2.45 a.m. The night was mild, cloudy, and fairly light. Night singing of the Lesser Whitethroat does not appear to have been reported by any British observer, but a case has been recorded on the Continent of a bird which sang regularly during the night in two successive seasons. (C. Krietsch, *Beit. Fortpfl-biol. Vög.*, 1931, p. 182).

BLACK-NECKED GREBE BREEDING IN CHESHIRE.—Mr. E. Hardy states (*Field*, Aug. 23, 1941, p. 249) that at a field meeting of the Merseyside Naturalists' Association at Oakmere, Cheshire, on Aug. 3rd, 1941, a Black-necked Grebe (*Podiceps n. nigricollis*) feeding two young in down was watched. It will be recalled that Mr. A. W. Boyd recorded a definite case of breeding on another Cheshire mere in 1939 and gave evidence of possible breeding in other years (*antea*, Vol. xxxiii, pp. 163-4).

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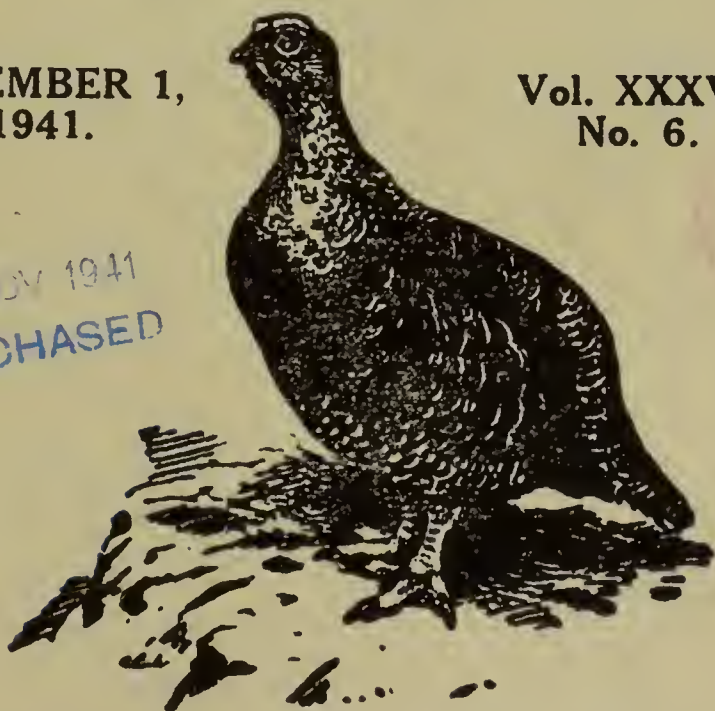
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THE SPRING MIGRATION OF THE RED-BACKED SHRIKE OVER EUROPE

BY

H. N. SOUTHERN.

THIS article forms the fifth and last of a series of studies on the spring migrations of selected species of birds. Those, for which maps have already been published (Southern, 1938a, 1938b, 1939, 1940) are the Swallow (*Hirundo rustica*), the Willow-Warbler (*Phylloscopus trochilus*), the Redstart (*Phænicurus phænicurus*) and the Wood-Warbler (*Phylloscopus sibilatrix*). The last species to be treated is the Red-backed Shrike (*Lanius collurio*).

One of the main objects of this series of studies, as mentioned in the previous articles, has been to investigate differences in the types of yearly northward movement, as shown in passerines of fairly divergent families and habits. Two-fold influences probably mould the characteristic spread of each one: the movement of the spring isotherms northward and the past and present geographical distributions of the species concerned. In the case of the Willow-Warbler especially, a remarkable conformity of the rate of spread with the isotherm of 48°F. was demonstrated. The Redstart showed the influence of "peripheral lag," and the Wood-Warbler showed a converse tendency.

In the case of the Red-backed Shrike it is even more necessary to make a preliminary survey of its distribution and history. Fortunately previous work has found out a number of facts about this shrike's migration. Schweppenburg (1926) went very carefully into the records of this species over the Mediterranean, Europe and western Asia, and remarked upon the extraordinary lack of data during the spring for western Europe. Contrasting this with the wealth of records for Palestine and Asia Minor, he drew the conclusion that the vast majority of European summer residents travelled by this eastern route, skirting the Mediterranean, and turned westwards through the Balkans. A glance at the accompanying map will confirm this distribution of records.

Another article by Ecke (1936) traces the migration routes of shrikes ringed in Germany. These ringing returns all confirm the idea that the eastern Mediterranean coast is a sort of bottle-neck, through which all the migrants pass on their journey to and from Africa. Unfortunately little, if anything, seems to be known about the movements of Red-backed Shrikes from the British Isles or France, so that we cannot



Map showing Rate of Spread of the Red-backed Shrike (*Lanius collurio*) over Europe during the spring. The continuous black lines, dated at the right-hand ends, are isochronal lines showing the stage achieved every fortnight. The dotted lines, dated at the left-hand ends, show the movement of the 48°F. isotherm for comparison. Each square represents a place for which an average arrival date was worked out from local data. [Projection: Bonne's]

be certain whether the few records from the western Mediterranean indicate that birds from a small area of summer residence regularly take a different route from the vast majority of the European stock.

Such a well-defined migration route might well be expected to influence the manner of spread of the species over the continent.

Another factor to be taken into account is that, like the Wood-Warbler, the Red-backed Shrike does not reach to the most northern part of Europe. In fact its breeding range is the most circumscribed of any of the species considered. To the north the breeding limit passes across the north of England, then across southern Scandinavia and Russia at a level of about 64°N . In the south only the north-east corner of the Iberian peninsula is inhabited: the southern boundary runs thence along the Pyrenees, across the toe of Italy, through the Gulf of Corinth and into Lebanon (data from Jourdain, 1939, and Niethammer, 1937).

In the case of the Wood-Warbler this northern boundary seemed to have a slowing down effect upon the rate of spread and the appearance in the most northerly localities showed considerable lag. This does not appear in the case of the Red-backed Shrike.

CHARACTERISTICS OF THE RED-BACKED SHRIKE'S MIGRATION.

The map was compiled as before. The data show a marked regional distribution due to the majority of migrants following a north-west route into Europe (see above).

The thick black lines show the positions occupied at the end of each fortnight: dates are given at the right-hand end of these lines. The northern boundary of the breeding range is indicated by a thick interrupted line. Thin dotted lines, dated at the left-hand ends, show the movement of the 48°F . isotherm, as given in Bartholomews' Physical Atlas (1899). Localities, from which data were obtained, are indicated by black squares: most of these gave a mean arrival date for ten years, but, especially in the south-west and in Asia Minor, some dates from one or two years have been included on account of the difficulty of obtaining satisfactory records. It is hoped that these will not have distorted the picture too much.

The northward spread of the Red-backed Shrike over Europe proper begins about April 10th at Gibraltar, but, since the records here are so poor, it is better to start at the Sinai peninsula, where the first birds usually arrive about

April 1st. The northern boundary of the range is occupied by May 15th, so this distance is covered in 45 days. Supposing that migrants, which nest in the north-west of Europe spread from the Asia Minor region, they must radiate out and cover a distance of 2,500 miles to Britain and 2,300 miles to the most northward part of the range in Russia. This means that the spread takes place at an average speed of about 55 miles a day, which is well in advance of any of the previous species.

If, however, any considerable numbers take the western route, the shorter distance is covered in 35 days, or at about 34 miles a day. This more leisurely rate would be in keeping with the idea advanced in the studies of the Redstart and Wood-Warbler, that where numbers are most numerous the spread proceeds more rapidly.

The isothermal lines have been included in this map to illustrate the complete lack of any correlation between them and the isolines. The configuration of the latter is at first sight remarkable. In this instance they certainly throw light on the main migration path. In other species, which spread up to the European continent from a number of points, the actual routes taken have little effect on the rate of spread, and indeed this would be expected. But here the isoline for May 1st shows a most distinct two-fold thrust along the line of the migration indicated by Schweppenburg and Ecke. This is more marked, if the western part of the line, where the records are so scanty, is neglected. This north-western bulge shows more faintly, but already in a quite marked fashion, in the line for April 15th. It is possible that it is even more marked than this, because the records given for Asia Minor are all from a considerable height above sea level, and it is reasonable to assume that they would appear in the coastal regions earlier. Dates from the Cyclades and the Asia Minor coastline would have been very welcome.

The line for May 15th however shows a strange inversion of this bulge. It seems as if the May 1st bulge came near the Baltic coast and split into two, one going north-west and west, and the other north-east. It certainly looks as if the Red-backed Shrike, not content only with evading a Mediterranean crossing, was also desirous of avoiding a Baltic crossing, and, whenever confronted by water, showed a tendency to split the company and drive forward along either shore. The curious two-fold bulge in the isoline for May 1st might well be due to a faster rate of spread along the Adriatic coast and the coast of the Black Sea.

The simplest form of migration performed by the Red-backed Shrike is outside Europe in the Asiatic part of its range, where it spreads directly northward without any complications. Supposing that this represents the main stock and that the European breeding range is an extension, which has been inhabited more recently, it is possible that the original habit of following a land route has persisted, and that the main twist, which occurs at the eastern end of the Mediterranean, may be a recapitulation of the way in which the species has extended its range.

This could be paralleled by the case of Eversmann's Warbler (*Phylloscopus borealis*), which has similarly occupied territory in a north-west direction, but still retains the original direction of migration (see Ticehurst, 1938). The main spring movement of this species is from Malay northwards into the upper part of Russia. Birds which breed in European Russia and Finland follow this direction and then turn westwards.

Such an adaptation (for as such it must be considered broadly) involves some biological problems of interest. The longer journey, due not only to extension of the range, but to preservation of the original route as well, which means passing along two sides of a triangle instead of one, will mean a later arrival at the breeding area. This could be answered by either (1) a much accelerated rate of spread, or (2) some measure telescoping the breeding season. The Red-backed Shrike has a faster rate of spread than any of the other species examined in these studies, and still does not start to nest until about the end of May, and produces only one brood in the season.

The case of Eversmann's Warbler is still parallel: it does not start to nest in its European quarters until July and has only one brood, unlike other European *Phylloscopi*, whereas it arrives at Yenesei in early-mid June.

This question of late arriving migrants would be worth fuller investigation, but it may be noted here that the Nightjar (*Caprimulgus europæus*) has evolved a complicated version of answer (2). Two broods are squeezed in by the male taking charge of the first young soon after they are hatched, while the female goes off and starts incubating a second clutch (see Lack, 1932).

Against all this it should be remembered that most of the shrikes are single-brooded and rather late breeders, and that there may conceivably be some correlation between late arrival in the more northern parts of Europe and its predatory habits, inasmuch as food would be more plentiful then.

The Red-backed Shrike's migration is characterized therefore by :

- (1) late arrival and rapid rate of spread, compared with the previous species.
- (2) isolines indicating most rapid rate of spread along the main migration route north-west over Europe, especially along coasts.
- (3) absence of correlation between isolines and isotherms.

The writer hopes to make a more extended study of these five species, now that each has been examined separately. It is also hoped then to make acknowledgment of the many sources of information that have been used.

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THE INSTINCTIVE NATURE OF NEST SANITATION

BY

STUART SMITH, PH.D.

RECENT work [I] on the means by which Passerine birds succeed in keeping their nests free from contamination by the excrement of the young, has stimulated me to give closer attention to this point whilst studying and photographing birds from the hide during the past nesting season. In particular, a number of experiments have been carried out on two species—the Yellow Wagtail (*Motacilla f. flavissima*) and the Willow-Warbler (*Phylloscopus t. trochilus*) in an attempt to determine the nature of this process, together with the factors stimulating the urge of the adult birds to dispose of the fæces.

A Yellow Wagtails' nest was found under a clod on a piece of fallow ploughed land which had been heavily limed. It contained three eggs which proved to be the full clutch, and these hatched on June 3rd. A hide was erected and watching and photography commenced on June 8th when the young were five days' old. The nest was in a deepish cavity beneath the clod, with a small tunnel-shaped approach down which the adult birds walked to the nest. At first, the method of excrement removal was normal, both birds standing on the side of the nest after feeding the young, and stimulating them with occasional "prodding." The encapsuled fæces were taken from the cloaca as they emerged, carried away in the bill, and dropped at a distance. After about an hour, the lighting on the nest became so difficult from a photographic point of view, that it was necessary to open up the site considerably, and during this process a number of small balls of caked white lime with which the field had been treated, fell into the vicinity of the nest. The cock Wagtail was the first to return, and he immediately walked up to the nest and fed the young, and then without waiting for them to defecate, he seized one of the lime balls and walked away with it! This was repeated many times, the area round the nest being finally cleared of these white pieces. The hen, on the other hand, confined herself to the genuine fæces.

The main interest in this observation lay in the fact that many pieces of caked lime had been in the close vicinity of

the nest before the site was opened up, yet up till then had been totally disregarded. The reason for this appeared to be that the opening up of the nest-site had enabled the approaching bird to see the nest and young clearly from a greater



Nestling Willow-Warbler (6 days' old) depositing fæcal sac on "latrine."
(*Photographed by* STUART SMITH.)

distance; it had so to speak, enlarged the "sphere of influence" of the nest and young, and this additional stimulus had so acted on the cock bird that he instinctively picked

up any white object near to the nest. In order to demonstrate this point, the surroundings of the nest were replaced so as to resemble as closely as possible the site as it was at first, and a number of the lime balls collected together and arranged inside a small area around the nest. Some screwed-up balls of paper were also included. The cock Wagtail returned, fed the young, and promptly waited for one of them to defecate! He took no notice of the white objects in the vicinity of the now hidden nest. On his departure, the nest-site was re-opened, when the bird once again commenced the former practice of carrying away the lime particles. He removed the paper balls as well.

The area cleared round the nest was a circle of about one foot radius, and beyond this the stimulus appeared to die off. It seems therefore, that in this instance the action of the bird was clearly an instinctive one, stimulated by seeing the young and/or nest. Which of these two factors was the dominant one it is not possible to say with certainty. In passing, it may be mentioned that the use of white balls of paper simulates Ralph Chislett's experiment [2] in which he succeeded in getting a male Dipper (*Cinclus c. gularis*) to remove such objects from the vicinity of the nest.

In the case of the Willow-Warbler, a nest was found containing seven eggs from which six young hatched on June 11th. These were studied on June 16th and 17th when the young were five and six days' old. The nest was well hidden, and the surroundings had to be somewhat drastically bent back in order to open up the site. Both adult birds fed the young, and both removed fæces. The method was as described by Blair [3] except that the position of the "latrine" was exactly in the centre of the rim of the nest. The fæcal sac was usually deposited in such a way that it was held in place by one or two strands of nesting material (see photograph here reproduced). The adult bird on returning, would alight at one side of the nest, feed the young, and then seize the fæcal sac from the latrine in the bill and fly away to drop it at a distance. On occasion however, due perhaps to slight nervousness at the presence of the hide, the alighting bird would dislodge the fæcal sac from its position, and it would roll down to the base of the nest. When this happened, the birds were plainly in two minds, for they had an urge to feed the young, and another conflicting one to retrieve and remove the excrement. Usually the feeding of the young was accomplished first, although once the male promptly swallowed the food

he was carrying and retrieved and bore off a faecal sac which he had dislodged on alighting at the nest. This points to the instinct to remove faeces being of at least the same order of strength as that to feed the young.



Parent Sky-Lark awaiting faecal sac from young 5 days' old. The sac is just emerging from the cloaca, the young bird raising its hind-quarters.

(Photographed by Stuart Smith.)

The instinct of the parent birds to prod the young in order to induce defecation is very common in most of the passerine order, but closer observation has led one to the belief that tugging at the down is an equally common form of stimulation. Prodding of the cloacal region often takes place, but very often the adult bird seizes a piece of down, usually on the nestling's back, and gives a short tug which may easily be mistaken for a "prod" unless the action is closely observed. Other forms of stimulation, though not common, are by no means very rare. Thus in the case of a nest of a Reed-Bunting (*Emberiza s. schæniclus*) under observation, with young three days old, the male and female used the down-tugging method frequently whilst the female, a very solicitous parent, would work herself up into a highly excited state if the young did not defecate immediately after she had fed them. On one occasion she tried, on the same nestling, first prodding of the

cloacal region ; then tugging of down on the back ; then she passed her bill right down the youngster's wing with a stroking motion ; and finally evidently under considerable emotional stress, seized the young bird's head in her beak and shook it violently to and fro. Fortunately this produced the desired effect ! The strength of the instinct to stimulate the young seems variable, but from my own observations it appears to be stronger during the first half of the fledging period than the last, due probably to the fact that as the young grow and stage 3 described by Blair as " the active co-operation stage " is reached, the necessity for violent stimulation more or less disappears.

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NOTES

SOME SPRING MIGRANTS SEEN IN ORKNEY.

These notes were made during residence in Orkney from March to the end of July, 1941. Some of the species have rarely been recorded from Orkney in spring. Dates of arrival for some common species are included as I was likely to have seen them within a day or two of their first arrival.

TREE-PIBIT (*Anthus trivialis*).—One Balfour Castle woods, Shapinsay, May 28th.

SPOTTED FLYCATCHER (*Muscicapa striata*).—One in a garden on Burray, June 7th.

GARDEN-WARBLER (*Sylvia borin*).—One in full song in Trumland woods, Rousay on June 1st; a secretive individual in gorse on South Ronaldsay on June 7th.

REDWING (*Turdus musicus*).—Last seen April 29th on Hoy. From the rose on the flanks this was almost certainly *T. m. coburni*. One found dead on Hoy was definitely *T. m. musicus*.

ROBIN (*Erithacus rubecula*).—A wild passage migrant on a farm on South Walls, April 9-10th.

WHEATEAR (*Enanthe ænanthe*).—First seen April 6th.

SWALLOW (*Hirundo rustica*), MARTIN (*Delichon urbica*) and SWIFT (*Apus apus*).—were all first seen on May 28th on Shapinsay. No more seen till June 12th when all three species, including 12 Swifts, were seen on Hoy. These were travelling north, as were other parties, especially of Swifts, seen regularly during the next fortnight. But on July 8th, three Swifts were flying south here, and during the next three days several more parties passed moving in the same direction. Hence there was an extremely short interval between the end of the spring and beginning of the autumn migration. Certainly no Swifts, and probably no Swallows or Martins, bred in Orkney in 1941.

CUCKOO (*Cuculus canorus*).—A tired bird on Stronsay, June 27th.

GOLDENEYE (*Bucephala clangula*).—Six, of which three were immature males, on Sanday on June 28th. Doubtless they had stayed the summer.

BLACK-TAILED GODWIT (*Limosa limosa*).—One North Ronaldsay, June 12th.

WHIMBREL (*Numenius phæopus*).—One, not breeding, on Westray moors, June 26th.

WOOD-SANDPIPER (*Tringa glareola*).—One Stronsay, June 27th.

SCANDINAVIAN LESSER BLACK-BACKED GULL (*Larus f. fuscus*).—One Loch Stenness, Mainland, March 23rd.

ARCTIC TERN (*Sterna macrura*).—First arrivals seen May 11th.

CORN-CRAKE (*Crex crex*).—First heard May 7th, general by May 11th.

DAVID LACK.

PAIR OF CARRION-CROWS IN KILDARE.

As the Carrion-Crow (*Corvus c. corone*) has been very rarely observed in Ireland the following particulars of a pair I watched daily from July 20th to August 5th, 1941, during a visit to my old home, Metcalfe Park, near Johnstown-Bridge, Co.

Kildare, should be put on record. These birds came to a grass field recently cut and constantly flew over the garden, but I was never able to discover their headquarters. One of the birds bowed and postured and on one occasion attempted coition but was repulsed, while at another time one fed the other, from which actions I judged them to be a pair. I may say that there is a rookery in the park, but the Crows kept quite apart from Rooks feeding in the fields. Their stouter bills, greenish-black plumage and harsh "karrah" note identified them clearly from young Rooks apart from the actions described above of two birds feathered up to the bill.

Hooded Crows have increased in the district but I have not personally seen Carrion-Crows there before. My sister—Miss Metcalfe—however, told me on arrival of these two birds, which she thought were Carrion-Crows and had observed since the spring of 1940. No young have been seen and evidence of actual breeding is absent. H. RAIT KERR.

STARLINGS TAKING YOUNG CHAFFINCHES OUT OF THE NEST.

THE following notes made by Mr. J. H. Stacey of The Oaks, Alderholt, Fordingbridge, Hants, and sent to me by a mutual friend, the Rev. C. E. Boulton, of the Vicarage, Alderholt, will be of interest to some of your readers.

The observation was made between April 25th and May 25th, 1941. Mr. Stacey states that he was ill in bed and a pair of Chaffinches (*Fringilla c. gengleri*) built a nest in a fir tree six yards from and on a level with his bed. During incubation the hen only sat for 10 to 15 minutes at a time being absent for equal periods, so that he doubted if she would hatch her eggs. He never saw the male bird sit, but both birds collected food for the young. Whenever the hen fed them she always sat on them, for ten minute periods, as on the eggs. The male bird cleaned the nest of the droppings. The young eventually got strong enough to lift their heads for food. Starlings (*Sturnus v. vulgaris*) now came to reconnoitre the tree, and on the third occasion one of them got into the nest and took one of the young away by its neck, while it was still unfeathered. Three or four days later two Starlings came together, and the cock Chaffinch drove off one, but the other got to the nest and took off another chick. The Chaffinches were very courageous in defence of their nest; on one occasion the male Chaffinch rammed the Starling from the rear, upsetting it from its perch. Mr. Stacey did not see the rest of the

robbery but eventually the nest was empty. He states that he saw the Starlings dealing with another nest, but this was not near enough for him to see details. He suggests that the May drought, making ground food scarce may have caused the Starlings to seek this unusual food. W. R. THOMPSON.

BLUE-HEADED WAGTAILS IN GLAMORGAN AND MONMOUTHSHIRE.

DURING the first three weeks of August, 1941, Yellow Wagtails (*Motacilla f. flavissima*) on passage were noted about Llanishen Reservoirs in unusual numbers, and on August 24th, there were between 50 and 60 in two separate flocks. Among the many individuals examined at close quarters on that date, one was conspicuous because it had a vivid patch of white feathers, probably due to being in moult, on its right wing, the left being normal. It was also noted that the eye-stripes of this bird were practically pure white, a feature very noticeable when compared with those of other wagtails close at hand, also its head was distinctly greyer and the rest of its plumage brighter, especially the markings of its wings. Although it was impossible to get a good sight of its chin, what could be seen of it looked more white than yellow, and we had no doubt that the bird was an adult male Blue-headed Wagtail (*Motacilla f. flava*) which was just acquiring its winter plumage. This is the first record of this species in Glamorgan.

On April 21st, 1940, Mr. J. G. Williams secured an adult female at Peterstone Wentloog, Monmouthshire, and saw an adult male there also, on the same day. This is the first definite record for this county although probable occurrences had been reported to us from the same locality, by Mr. J. G. Beckerlegge on July 11th, 1936, and Mr. G. Sully on June 5th, 1939. GEOFFREY C. S. INGRAM AND H. MORREY SALMON.

ABNORMALLY COLOURED PAIR OF YELLOW WAGTAILS IN NORFOLK.

During the summer of 1941 an abnormally coloured pair of *Motacilla flava* (? sub-species) were discovered by Mr. Jim Vincent at Hickling, Norfolk, breeding on a marsh frequented by Yellow Wagtails (*M. f. flavissima*), and in case birds of a similar type occur in the future, either in Norfolk or elsewhere, I think some account of them should be given. The nest was in the usual situation in a tussock of grass on an open marsh. The clutch of five eggs was completed on June 7th and the

five young birds left the nest on June 28th. After the young were hatched a hide was erected by the nest from which Mr. Eric Hosking took a series of photographs of the birds feeding their young, while Mr. J. C. Harrison made some water-colour sketches of the male and female. The following descriptions are from notes which I made in the hide with the birds no more than three feet away.

MALE :—Crown, ear-coverts, nape and mantle pale bluish or “pearl” grey. Eye-stripe, chin, throat and breast white with just the faintest tinge of lemon-yellow, most marked on the chin and throat, the upper-breast being almost pure white. Belly a deeper yellow. Wing-coverts and secondaries brown with very pale buff edges. Primaries brown. Tail blackish-brown, outer tail-feathers white.

FEMALE :—Like male but with a narrower eye-stripe and a complete absence of yellow on the under-parts.

The striking feature in both birds was the complete absence of brown or green on the mantle, which was the same shade of grey as the head, and the absence of yellow, complete in the female and comparative in the male, on the under-parts.

This abnormality of plumage, corresponding with no known race of *M. flava*, and affecting both birds of a mated pair, seems difficult to account for except as a form of mutation. The young ones, which I saw when fully feathered, appeared to me to have the normal plumage of juvenile Yellow or Blue-headed Wagtails.

It may be recalled that the male of a pair of Wagtails presented to the Norwich Museum by Mr. Jim Vincent, taken with their nest and eggs by the late R. Vincent at Hickling on June 11th, 1894, is of the type of Sykes's Wagtail (*M. flava beema*). Also, in 1940, Mr. Jim Vincent recorded an abnormally coloured pair, which nested and reared a brood at Hickling, as follows :—“The female's plumage was different from any I had seen before. It was pale grey over head and neck and also on throat and chest and was slightly yellow at the vent The male bird had a pale grey crown with eye-stripe above and below akin to the bird I gave to the Norwich Museum.” In addition to this pair a normally coloured pair of Blue-headed Wagtails were nesting on the same marsh of which Mr. Vincent wrote : “The male of this pair was darker on the crown and back than the grey-headed male, and the female had a whiter eye-stripe than any of the female Yellow Wagtails.” (*Wild Bird Protection in Norfolk* in 1940. pp. 17 and 18).

I might add that the eggs of this 1941 pair were of a dirty white ground-colour mottled with pale grey, instead of the yellowish-brown typical of most Yellow Wagtail's eggs.

I have to thank my friend Jim Vincent, the discoverer of these birds, for permission to publish this note.

B. B. RIVIÈRE.

"YELLOW" WAGTAILS FEEDING YOUNG WITH DRAGONFLIES.

IN the details of the food of the *flava* group of wagtails, given in the *Handbook*, there is no mention of dragonflies forming part of the diet. I should like to record that while observing the pair of mutant wagtails, described by Mr. B. B. Rivière, in Norfolk this June (1941) both Anisoptera and Zygoptera were seen brought to the nest and given to the young. Among the dragon-flies *Aeshna grandis* Linn. and *Aeshna cyanea* Müller were probably the two most frequently brought and the damsel-flies included *Enallagma cyathigerum* Charpentier and *Pyrrhosoma nymphula* Sulzer and probably *Ischnura elegans* Van der Linden.

The wings were removed from all dragon-flies, though left intact on the damsel-flies. The insects were delivered to the young head first and pushed well into the throat. At eight days of age the chicks experienced considerable difficulty in swallowing the Hawker dragon-flies and for some moments afterwards the rear of the abdomen and anal appendages could be seen protruding from the bill. At ten days of age the young swallowed these large dragon-flies with ease and they formed a considerable part of the diet. ERIC J. HOSKING.

RED-BREASTED FLYCATCHER IN NORFOLK.

ON Sept. 3rd, 1941, as I was cycling through the village of Hickling, I saw an adult male Red-breasted Flycatcher (*Muscicapa p. parva*) fly off the wire stay of a telegraph pole into a willow tree within a few yards of me. It was facing me when I first saw it on the wire stay, and settling on the willow tree it again faced me. As I watched it flew down to a wire fence, and quickly flew back to cover again. The white patches at the base of the tail were very noticeable in flight and also when perched, as it often flicked its tail in flycatcher manner. Its red breast gave it the appearance of a Robin in miniature. I saw the late E. Ramm of Cley kill an adult of this species with a very red breast in Sept. 1908, as it settled on the rigging of an old smack in Blakeney Harbour. JIM VINCENT.

MARSH-WARBLER IN HERTFORDSHIRE.

ON June 24th, 1941, I heard a Marsh-Warbler (*Acrocephalus palustris*) in full song on the bank of Wilstone Reservoir, Tring, but was unable to stay and observe him, nor could I revisit the spot until July 4th. The bird was then singing ebulliently, at the same haunt ; and my wife and I were able to watch him for an hour and a half at midday, often at only six yards distance. During that time he sang continually, either perched on an adjacent black poplar or exposed on the outermost spray of a small hawthorn by the water's edge. Among other song imitations we noted that this bird favoured versions of the Blackbird's call ("chuckle") and Willow-Warbler's and Greenfinch's songs. Sedge-Warblers were singing a furlong off, Reed-Warbler but a quarter of a mile further on. Neither on July 8th when I next sought this bird, nor on July 12th could I find any trace of him. To judge from his behaviour he had taken up "territory" and was waiting for a mate ; at least we could see no signs of either nest or mate.

This appears to be the first record of the Marsh-Warbler in Hertfordshire.

BERTRAM LLOYD.

GREAT SPOTTED CUCKOO IN NORFOLK.

ON July 29th, 1941, at Hickling, I was in a hut at the edge of a black currant plantation around which there is an electric cable. It was raining steadily. My attention was drawn to a strange looking bird sitting on the cable. It was very erect and its long tail, light throat and breast, as well as the shape of its head made me anxious to see more of it. The bird flew down to the bushes, when it was more conspicuous still. After a few minutes it flew back to the cable much nearer the hut, about 40 yards away and faced me. When it turned its head I could see a conspicuous crest slightly raised. The bird again flew down to the bushes for fruit or caterpillars. Marking the spot I walked briskly towards it keeping two rows of bushes between me and the bird. I got within 8 or 10 yards of it, when it flew away from me keeping low.

In general appearance the bird was brownish, with dark grey crown and nape, but its long tail edged with white and the spotted pattern of its wing gave it a pied appearance and somewhat the look of a Magpie.

I saw enough of the bird perching and in flight to realise that it could only be an adult of the Great Spotted Cuckoo (*Clamator glandarius*).

JIM VINCENT.

MARSH-HARRIERS IN WEXFORD AND
PEMBROKESHIRE.

I HAVE received for mounting an immature Marsh-Harrier (*Circus æruginosus*) shot on the South Slab of Wexford on Sept. 1st, 1941. This I think is the first time it has been recorded from Wexford and the bird has been reported in recent years only very occasionally in Ireland.

EDWARD WILLIAMS.

ON Sept. 11, 1941, we flushed a Marsh-Harrier (*Circus æruginosus*) from the swampy pool on Dowrog Common near St. David's. After flying to a distance it returned and passed close to us, giving us an excellent view of its generally dark plumage with almost white crown and patches on shoulders. It flew off to the south-west and was not seen again on two subsequent visits to the locality. Mathew in his *Birds of Pembrokeshire*, 1894, called the Marsh-Harrier a rare accidental visitor to the county. He mentions one seen by himself in the winter of 1880 and gives several other records without dates. There seems to be no later record.

W. B. ALEXANDER & M. C. RADFORD.

[I observed one hunting a rushy flat in the Prescelly Hills on August 14th, 1929.—H.F.W.]

CREAM-COLOURED COURSER IN SOMERSET.

A CREAM-COLOURED Courser (*Cursorius c. cursor*), an adult, as we discovered later, was first seen about 4.30 p.m. (summer time) on September 24th, 1941 on Minehead Golf Course. My wife was with me at the time, but neither of us had binoculars. The bird was standing on a ridge about 100 yards distant, and although the light was not very good it showed up distinctly against the grass background. We approached slowly to within some 40 yards, and then it ran off quickly down a slope, but stopped and turned after it had covered about 25 yards. My first impression was of a light sandy-buff coloured bird with a short tail, and long white legs—very noticeable on the scanty grass. In general form it reminded one of a small, long-legged Golden Plover. We got to within about 35 yards before it again ran off for a short distance. This time we were able to get within 25-27 yards of it, and could see the short dark beak and black primaries. Two golfers on one of the greens were now directly ahead of it, and when we tried to get closer it rose and flew off in the direction of Dunster beach. It appeared much larger when on the wing, and as it crossed in front of us we had a splendid

view of the black wing-feathers, and black under wing-coverts. The flight was rather wavering, but fairly rapid. It zig-zagged slightly rather like a Snipe, but was not nearly as fast. Shortly after rising it uttered a single rather deep "wutt." This was repeated in about two seconds. Owing to poor light and lack of field-glasses it was impossible to see the head and neck markings on this occasion.

Next morning, September 25th, my wife was down on the Golf Course by 10.45 a.m., and by 11 a.m. had located the bird. With field-glasses the black and white lines over the head and neck were easily observed. My wife was soon joined by an intelligent groundsman who makes a habit of noticing any unusual birds on or near the Golf Course, and he stated he had first seen the bird the previous afternoon, so it seems probable that September 24th was the date of its arrival.

The same afternoon, in company with Mr. E. W. Hendy, I again visited the links, but it was not until we had covered about three quarters of the course that I suddenly saw the bird flying directly towards us. It was still taking a somewhat zig-zag course, canting over to either side as it swerved. It was seen to turn, and apparently flew back in a large circle, and we found it standing on a ridge about 50 yards to our right. With the sun behind us we had an excellent view. It was considerably tamer than the day before, and even when we got to within some 25 yards it did not run, but simply worked away from us, frequently stopping to feed. Sometimes it would stand bolt upright, and looked very small on its long milky-white legs. When feeding, which it appeared to be doing on the swarms of crane flies which had invaded the Golf Course, one was reminded of a Ringed Plover, for it had the same curious jerky way of bringing up its short tail as it dipped forward. Once while standing on the ground, it uttered a short note like "wutt."

The general colour was a pale sandy buff—isabelline. Broad white superciliary lines extended from above the eye to the nape, where there was a light grey patch; while under these well defined black lines went from behind a beady black eye to the nape. The breast appeared to be rather more creamy than buff. The primaries were black, and when it finally flew the tail-feathers seemed to be tipped with white. Shortly after rising it uttered a sharp double note like "ark, ark." It again headed in the direction of Dunster beach.

The following afternoon, September 26th, was the last occasion on which it was seen.

A. V. CORNISH.

SPOTTED FLYCATCHER ATTACKING GREY SQUIRREL.—Mr. Bertram Lloyd writes that on June 17th, 1941 near Tring he watched a Spotted Flycatcher (*Muscicapa s. striata*) attacking a grey squirrel, which had approached its nest in a horse-chestnut tree. The Flycatcher followed the squirrel into a second and third adjacent tree and repeatedly flew at it, while it twice actually buffeted its enemy with its wings.

WILLOW-WARBLER'S NEST WITHOUT DOME.—The Rev. F. N. Hale sends us a description of the nest of a Willow-Warbler (*Phylloscopus t. trochilus*) built in thick ivy on his house in Shropshire. The nest was about a foot from the ground on a branch of the ivy, which had not been cut for two years and formed a thick covering. It was built of moss and lined with feathers, but had no dome.

REDSTART BREEDING IN GLAMORGAN.—Mr. John Beckerlegge informs us that he watched a pair of Redstarts (*Phænicurus ph. phænicurus*) feeding young in a nest near Pentytch on July 10th, 1941. The bird has become very scarce as a breeder in Glamorganshire and this appears to be the first definite record for a considerable number of years.

WOODCOCK BREEDING IN CARDIGANSHIRE.—Paymaster-Captain H. R. H. Vaughan, R.N. writes us that he has learned on reliable authority that the Woodcock (*Scolopax rusticola*) bred (young seen in July, 1941) on the borders of Cardigan and Carmarthen at the junction of the rivers Pysgotwr and Doethie. Mr. W. B. Alexander informs us that although he has obtained a number of breeding records for Cardigan there are none for Carmarthen.

ABSTRACT.

THE PHYSIOLOGICAL FACTOR INDUCING MIGRATION. A. Wolfson (1940). "A preliminary report on some experiments on bird migration." *Condor*, Vol. xlii., p. 93.

ROWAN'S well-known work opened up a new field of research in this subject by showing that it is possible to cause recrudescence of the gonads of captive birds after the breeding season by artificially lengthening the periods of daylight. From his original experiments with Juncos in Alberta, he also concluded that birds released with their gonads in a condition corresponding to winter minimum or breeding maximum showed no inclination to migrate, whereas those released with gonads undergoing recrudescence or regression departed on gaining their freedom. Further work, by Rowan himself and by others, has revealed various complications and difficulties. Bissonnette, who has made many contributions to this subject, has postulated an inherent rhythm of activity of the pituitary controlling the activity of the gonads, which is in line with other recent work in endocrinology; it is supposed that the state of readiness to migrate depends directly on the pituitary rather than on the gonads themselves. This makes it possible to account consistently for the migration of castrated individuals, as shewn by Rowan among others, and also of immature birds in the natural state.

In accordance with such views, migratory birds retained in their wintering area and released when their gonads attain breeding condition should not migrate. The experiments which Wolfson has made in California were designed to test this point. He used various migratory races of the Oregon Junco (*Junco oreganus*) which winter in that region, birds of a resident race serving as controls. The birds were taken into captivity before the spring migration and were released—with rings and visible marks—in early summer, at a time when they should have been breeding and when their gonads (as shewn by the examination of sampled specimens) were in fact fully enlarged. Marked birds of the resident race were recorded in subsequent trapping and observation in the neighbourhood, but those of the migratory races disappeared until the autumn.

This result is at variance with that obtained by Rowan with *J. hyemalis*, in the case of birds retained in their summer area and released in winter after having been artificially brought into breeding condition. (Most of Wolfson's birds attained breeding condition in the natural course, and the use of increased lighting in spring was found to make little difference). Apart from the season, Wolfson points out some differences in method: for instance, all his birds could have been collected within the period of a few hours after release allowed by Rowan.

Wolfson's suggestion is that "the total physiological and psychological state of the bird is important in inducing its migratory and breeding behaviour, and not the physiological condition of one organ alone." (He qualifies this by adding that "the state of each part makes up the whole, even though some part, such as the pituitary, may be sufficiently dominant in the physiology of the organism ultimately to determine the whole, and hence the type of behaviour exhibited.") Thus, the general state of his released birds may have been "sufficiently similar to that state at the normal time of migration to induce migration two months later than usual." They differed from wild birds simultaneously on their normal breeding grounds in being absent from these grounds, in having been forced to remain flocked together in captivity, in not having expended the energy required by migration, and in being well laden with fat.

Some evidence of differences in physiological state between resident and migrant races, consonant with this theory, is given. Further studies on this point are said to show promise of yielding significant data.

A.L.T.

REVIEWS.

Wild Bird Protection in Norfolk, 1940.

In the title of this report the year to which it refers has been misprinted as 1939. The reports from all the centres concerned (Scolt Head Island, Blakeney Point, Cley and Salthouse, Horsey and Hickling, and Breydon) contain details of the damage suffered by birds during the great frost and the unusual movements resulting from it. Many birds were found dead including not only small species but Herons, ducks, waders and gulls, while the Bearded Tits and Water-Rails at Hickling were among those badly hit. Perhaps the most interesting item in the report is the announcement that Fulmars were present on the cliff at Sheringham in May and two of them occupied a cleft but left it after June 2nd. At Horsey there was one pair of Marsh-Harriers and eggs were laid but not incubated for some unaccountable reason.

Among other items in the report we may briefly mention the following: Bitterns bred at Cley, and at the same place a Black Tern was

seen on the late date of October 17th, a Little Ringed Plover was identified at Hickling but no date is given, a Spotted Crake was constantly calling at the same place at the end of April, an Osprey appeared on April 26th and stayed until May 3rd and a White-tailed Sea-Eagle was present at the end of November. Also at Hickling a male Blue-headed Wagtail bred with a female which appeared to be also of the same form. Another pair was noted the male of which had a pale grey crown and the female appeared to be abnormally grey and pale.

Yorkshire Naturalists' Union: Committee for Ornithology Report for 1940. Edited by Ralph Chislett, (Reprinted from *The Naturalist*, April, 1941).

HITHERTO the Yorkshire Union's Report published yearly in *The Naturalist* has been very inconvenient for reference owing to its unsystematic arrangement. We therefore welcome this year's report which has been remodelled as the result of a re-organization and the establishment of an Ornithological Committee.

Some effects of the severe winter of 1939-40 are described in the opening pages and there are a good many notes on this subject in the classified lists. These last are arranged under Ridings and contain many observations of interest. Those for the West are noteworthy for the number of ducks and waders seen at reservoirs and sewage farms. In the North we note a flock of Lapland Buntings in January and February near Spennithorpe; Water-Pipits again visited the neighbourhood of Pickering, two being present from Dec., 1939 to March 11th, 1940, and three appearing on Nov. 16th, 1940; Wigeon again bred in 1940, two ducks being flushed and ducklings being seen by the same observers in the same lough as recorded for 1939 (*antea* vol. xxxiv, p. 68). In the East Gannets were reported, but it is not certain if they bred as no climbing was done and it was impossible to see from the cliff top.

London Bird Report for 1940. Compiled by R. S. R. Fitter. 1s. 6d. (London Nat. Hist. Soc.).

THOUGH this report is reduced in size the number of contributing observers has actually increased, but the closing of certain reservoirs has had a great effect on the observation of water-fowl. One of the most interesting events recorded was the attempted nesting at Chiswick of a pair of Golden Orioles. A nest was half built on May 4th (a very early date) but the birds then disappeared. The report also includes an account of the London Black Redstarts in 1940 of which details have already been given in our pages (*antea*, vol. xxxiv, pp. 136-7). Among other items of interest we may mention Blue-headed Wagtails seen at Beddington in May, a Red-crested Pochard, which may have been an escape, in the same locality on November 23rd, and an Iceland Gull at Staines from Dec. 25th, 1939 to Feb. 18th, 1940 (*cf. ante*a vol. xxxiii, p. 281). The report also includes special accounts on the status of the Sand-Martin, Teal and Curlew in the area.

Report of the Oxford Ornithological Society on the Birds of Oxfordshire, Berkshire and Buckinghamshire, 1940. Edited by B. W. Tucker. 2s. 6d. (Editor, University Mus., Oxford).

AN unusual number of interesting visitors were reported during the year, many of them appearing at the Slough sewage farm. Blue-headed Wagtails were reported from there in April and May and from Oxford in April. A Spoonbill paid a brief visit to Slough on May 8th. A Ruddy Sheld-Duck was seen there on March 21st and another on September 28th. Shovelers bred in all three counties. Red-breasted Mergansers were seen in Oxford and Berkshire in February and Shags in Oxford in

December, while a Little Gull near Oxford from November 12th to 22nd is noteworthy. Amongst many interesting waders recorded from Slough we may mention: three Red-necked Phalaropes satisfactorily identified on October 12th, a Turnstone on August 10th, a Temminck's Stint on May 24th and 25th, single Wood Sandpipers in April, May and August, Spotted Redshanks in March, May, August and September and one on the unusual date of Dec. 1st, this last being in 1939. There is also a record of a wader seen at Slough on May 19th, 21st, 22nd, which may have been a Marsh-Sandpiper. Finally an Iceland Gull—a rarity inland—was identified satisfactorily at the same place on April 6th and altogether the season's records from this sewage farm are remarkable.

Report of the Birmingham Bird Club, 1940.

NOTWITHSTANDING the war this report keeps up its interest and contains a number of interesting notes. A Water-Pipit was seen at Bittell (Worcester) on October 31st and a Firecrest was observed in November in Lickey Woods in the same county. A record is given of a Pied Wagtail being twice victimized by a Cuckoo in the same season and rearing both "broods." A Purple Sandpiper at Bittell on October 31st is the first observed in Worcestershire and a Spotted Redshank at Bellfields on August 28th is the first record for Staffordshire, while an adult male Long-tailed Duck at this reservoir in early November is also noteworthy.

Report on Somerset Birds, 1940.

THERE are a number of interesting records in this Report. There is the good news that two pairs of Pied Flycatchers bred in the county in 1940. A curious case is recorded of a Green and Great Spotted Woodpecker nesting in the same apple tree while there was an apparently fresh hole of a Lesser Spotted Woodpecker in a branch at the top of the same tree, though definite breeding in the last bird was not established. A Barnacle-Goose is recorded in January and single Gadwall in January and April. A Little Stint was seen on January 3rd, the second winter record for the county. The report closes with a short account of the frost of January, 1940 and dates of arrivals and departures of migrants.

Report of the Cambridge Bird Club, 1940.

THE Club has to deplore the sad loss of two distinguished Vice-Presidents—Miss E. L. Turner and Mrs. Brindley. The report is much restricted. The most interesting piece of news it contains is that Black Redstarts bred again in Cambridge and reared at least two young. Two pairs of the Hobby were reported to have bred in east Huntingdonshire, but no Bitterns nested in the Burwell Fen. Four Temminck's Stints are recorded for the Sewage Farm on May 16th.

Ornithological Report for the County of Hampshire, 1940. By F. H. Haines.

As in most local reports for the year there are here a good many notes connected with the severe weather in January and February. One of the most noticeable effects was the vast number of geese, especially White-fronted and Pink-footed, while some Grey Lag and Dark-breasted Brent Geese were also definitely noted. More Bitterns than usual seem to have been reported from this and other counties in the early part of 1940 and probably this also was due to the weather. Among other items of interest in this Report we may mention a Spoonbill in October, November and December on Stanpit marshes and a Flamingo (which may have been an escape) in the same locality in June and July. Two Hen-Harriers reported from Linwood in June are much more likely to have been Montagu's.

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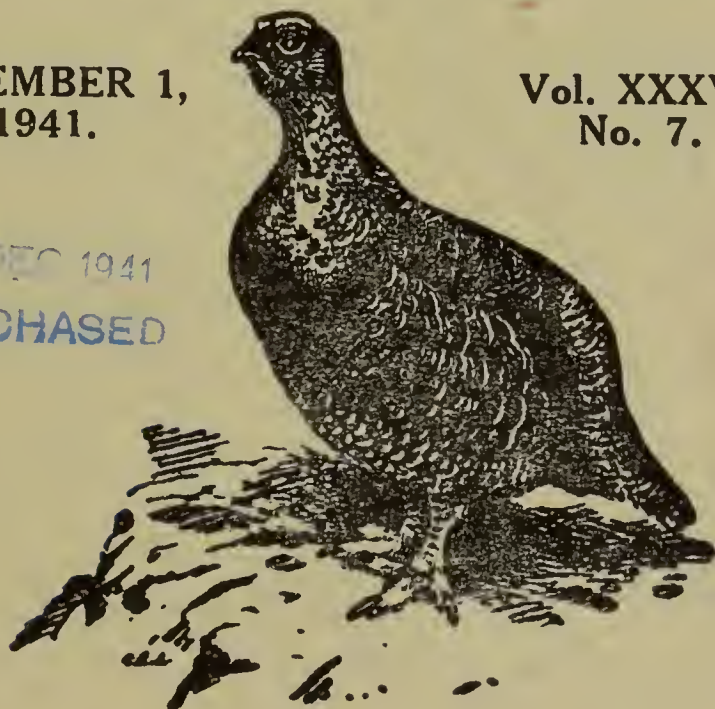
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SOME OBSERVATIONS ON ROOSTING BIRDS

BY

M. H. DUNSHEATH AND C. C. DONCASTER.

BETWEEN January, 1938 and March, 1939 we were able to make a study of the roosting habits of a number of common birds and the following notes are on the most interesting species observed.

The observations were made within an area of about 100 acres of park and farm-land in Reading. The park is bordered by a narrow stretch of woodland on one side and rough waste land on the other. It is terminated by a garden at each end and contains a small number of Wellingtonias amongst many other species of trees. The Wellingtonias consist of four *Sequoia gigantea* and three *Sequoia sempervirens*.

The main points we tried to record or discover for each species were as follows :—

- (a) The roosting place chosen ;
- (b) The manner of roosting ;
- (c) The height of the roost ;
- (d) The wakefulness and liveliness of the birds, and
- (e) The reactions of the birds to the prevailing weather conditions.

STARLING (*Sturnus v. vulgaris*.)

Our observations on Starlings were chiefly confined to a single pair which habitually roosted in the loft of a large building, but a few visits were made to neighbouring Starling roosts and other individuals and pairs were observed. The pair occupying the roost in the loft were first observed in November, 1938. The roosting place was on a small water-overflow pipe running over a last years' Starlings' nest and out through the eaves of the roof. In the following January, one of the birds was seen to make a short visit to the roost, leaving it at 3.5 p.m. Ten minutes later it arrived again, followed by a second bird. Photographs were taken of both individuals which temporarily frightened them away, but at 3.30 p.m. both reappeared. For the next 25 minutes they could be heard preening and scratching at odd intervals and finally they settled down. They were again photographed, but the results only showed one bird with its head sunk between its shoulders and bill pointing forwards — evidently not yet asleep. Again, at the end of January, another attempt was made at photographing the birds asleep. They arrived at the roosting place a few minutes past four o'clock,

after making a short preliminary visit as before. This time, however, they changed their roosting place and came across the nest to a recess in the roof formed by the wooden beams. The roosting place above the nest had become very dirty by this time and it seems possible that the change was made as a result. Again we failed to secure photographs of either bird asleep, but those obtained show the smaller covert feathers and scapulars much fluffed up in spite of the birds having been alarmed by some slight noise prior to the taking of the photographs. We think the reason for this fluffing out of the feathers is for the purpose of assisting in conservation of heat during the night.

HOUSE-SPARROW (*Passer d. domesticus*).

We have found Sparrows roosting gregariously in two different types of place namely, in ivy covering walls of buildings and in the smaller bushes surrounding a large Starling roost. In the former case the birds are not near enough to each other to cause a mass disturbance when an intruder approaches the roost, but in the latter case, on approaching the occupied bushes, the birds fly up in scores long before the roost is reached. Generally speaking, House-Sparrows are not lively when roosting singly or in pairs, and though they may be woken by slight noise or even by the beam of a torch on them, they usually remain on their perch until it is actually touched and shaken.

Sites chosen for roosting are usually in dry, well sheltered places which may be occupied under almost any weather conditions. We found a male Sparrow roosting regularly in a well sheltered cavity about three or four inches deep in the side of a haystack. This side of the stack was itself well sheltered by trees, so that few winds could drive into the roost. Irregularly, from January onwards, a female accompanied this bird and on many other occasions we found apparently paired-off birds roosting together. The chief places chosen for roosting, besides those already mentioned, have been in ivy covering trees of various species, in yews and on the foundations or remains of nests of Sparrows. The average height chosen has been about 7 ft. from the ground, but in the case of those roosting in yews, a higher place is often occupied. This may be 12 or 13 ft. up.

The manner of roosting is much the same as that of most other passerines observed, namely the body-feathers are fluffed out to a comparatively small extent, the bird squats more or less horizontally on the perch and the head is tucked

into the scapulars. In this way, the foremost half of the head is hidden and only the crown and nape are visible. On one occasion, however, we found a male Sparrow asleep, but with the bill pointing forwards. The head was hunched in between the shoulders and the body-feathers were fluffed up in the usual manner.

TREE-CREEPER (*Certhia f. britannica*).

Only three out of the seven Wellingtonias in the park contained roosts that were ever seen to be occupied by Tree-Creepers. One of these was a *Sequoia sempervirens* and a single Tree-Creeper was once observed roosting about 10 ft. up its trunk. A *Sequoia gigantea*, at the southern end of the park, contained four roosts that were occupied frequently until October, 1938 and then apparently abandoned. One of these roosts, situated about 12 ft. up the trunk, was occupied on one night only in January, 1938 and a second cavity, on the other side of the trunk and at about the same height was occupied on three consecutive nights in February. The weather conditions were similar on all these nights; namely, there was little or no wind, a clear sky and a minimum temperature of just over 30°F. A third and much lower roost (6 ft. 6 inches from the ground) was occupied on one night in March, and the weather conditions were similar to those of the previous occasions. On October 5th and 6th, the fourth and last cavity was found occupied and this was about 10 ft. up the trunk. The weather conditions were again similar to those of previous occasions.

During February, 1939 a single roost, about 5 ft. 6 inches up the trunk of another *Sequoia gigantea*, was occupied on many occasions. It is interesting to note that the weather conditions on all these nights were almost exactly similar to those encountered in 1938 when the Tree-Creeper was observed.

The manner of roosting appears to be a little obscure as far as the position of the head is concerned, but otherwise it seems fairly plain: the bird rests in a more or less vertical position in the roosting cavity, the tail usually being pressed against the bark below it to act as a support and the wings hanging loosely down by the sides. The feathers of the rump, back, mantle and scapulars are considerably fluffed up so that they completely hide the head and wing-coverts from view. The following observations seem to show that the head is neither buried in front of the bird, as described in this magazine by P. G. Kennedy (vol. xxx, p. 5), nor under the wing, as described by M. N. and D. H. Rankin (vol. xxxiv,

p. 56). On February 2nd, 1939, a Tree-Creeper was observed roosting with the head tucked well into the scapulars of one



TREE-CREEPER. Showing the head tucked into the scapulars of the left hand side. (*Photographed by C. C. Doncaster.*)

side, so that the crown and nape could clearly be seen from above. Later in the evening the same bird was re-visited and it was at first thought that it had changed the position of the head, but by studying the bird at close quarters and again from above, it appeared that the head was still in the same position, though buried deeper in the raised scapulars. Each subsequent time that this roost was occupied, it was possible to see the bird's head and a photograph was taken showing the position fairly clearly. It seems possible, therefore, that those individuals observed previously may have been roosting in a similar manner, the head not showing owing to the roosting cavity being more exactly the size and shape of the occupant. This might well be the case as the head would then be covered by the roof of the cavity and hidden by the raised scapulars. Tree-Creepers are very sound sleepers and only on two occasions have they woken and flown from the roost. On the first occasion an attempt was made to climb the tree in which an occupied roost was situated. This evidently disturbed the bird and without turning to see what was happening, it leapt from the roosting cavity and disappeared. On the second occasion, the occupied roost was approached quietly and without touching the particular tree. As a light was shone on to the bird it disappeared in like manner to the first. This may have been due to the bird changing the position of the head at the time of the approach. Evidence of such a change was obtained when a Tree-Creeper was found roosting with the head tucked into the scapulars of the right hand side of the body and later, when re-visited, the head was seen to be on the opposite side.

BLUE TIT (*Parus c. obscurus*).

The roosting places which appeared to be most favoured by Blue Tits were shallow holes in trees caused by the rotting away of a branch.

The holes that we have seen occupied were about 2 inches in depth and about $1\frac{1}{2}$ inches in diameter, and these were occupied quite frequently, though not on many consecutive nights. They have varied in height from about 8 ft. to 15 ft. up the trunk. On other occasions, Blue Tits have been found roosting in ivy covering trees, also at a height of about 8 ft., and the manner of roosting has been very similar to that of House-Sparrows: the birds were seen squatting on the thicker ivy stems with the head tucked into the scapulars. The body-feathers, however, were fluffed up to a great extent so that those of the flank and breast very nearly covered the

back and head. One bird roosting in this manner was woken either by the light of a torch or slight noise, but it did not attempt to fly. The wakefulness and liveliness seems to vary somewhat : a few individuals were roused after two or three flashlight photographs had been taken of them, but most were not disturbed by this procedure. Those that were woken, eventually flew from their roosting place after being dazzled by the light of a torch for several minutes.

The manner of roosting of those birds found in holes in trees has not been possible to decide, but presumably much the same posture is assumed as those found in ivy. Photographs show the feathers fluffed up to a considerable extent and the head evidently near the back of the hole. The tail projects straight out of the hole at a distance of not more than an inch.

The birds evidently disliked wind, rain and excessive light, and only on one occasion was a Blue Tit seen roosting in a hole in a tree that was open to the light of the moon. On windy or rainy nights, more sheltered roosts were apparently chosen.

COAL-TIT (*Parus a. britannicus*).

Three Coal-Tits were found roosting singly on the upper sides of the lower horizontal branches in an avenue of cedars. Each was about 6 ft. from the ground and very well protected above by a thick mat of foliage. Their heads were tucked into the scapulars of either side and the body-feathers, especially those of the flanks and breast, were fluffed up to a considerable extent. These birds were particularly heavy sleepers and even though the branches on which they were roosting were lightly shaken, no disturbance was caused. On a number of other occasions Coal-Tits were found in old and dilapidated nests of uncertain origin and these birds were generally more wakeful and lively. One nest situated in one of the cedars, about 8 ft. from the ground, possessed a cavity in its base and in this a Coal-Tit was found roosting on several occasions. Presumably the bird had excavated the cavity itself, as the nest was probably a Blackbirds' originally. This particular Coal-Tit was both wakeful and lively, and whenever the occupied nest was touched, the bird woke and eventually flew out. Occasionally it flew immediately it was woken and several times it was woken even by slight noise or by the light of a torch on it. All the individuals roosting in the cedar avenue were observed between October and November of 1938, but there was an apparent absence of them after this date.

In the following February a Coal-Tit was observed roosting in a particularly open place : it was in an old nest with one of

the walls slightly overhanging the hollow. The nest was situated about 5 ft. from the ground in a small and sparsely foliated bush. There was, on this occasion, very little wind, however, and the night was fine but frosty.

BLACKBIRD (*Turdus m. merula*).

The most common sites chosen by Blackbirds for roosting were found to be thick, dense bushes or trees. The roosts were usually between 3 and 8 ft. from the ground. Little can be said regarding the manner of roosting, but it is assumed that the birds took up much the same attitude as House-Sparrows or other passerines roosting on a definite perch. The wakefulness of the species was very marked and not once were we able to approach a Blackbird without it waking. Hence, we were unable to note the manner of roosting. The liveliness of the woken birds varied considerably, however, some allowing us to shine a bright torch on to them at close quarters and make a considerable noise, while others flew from their roosts at the sound of our approach. The choice of roosting place appeared to be influenced chiefly by rain. Most roosts were so well sheltered that little wind could penetrate them in any case, but during wet weather situations such as the interior of a box bush were particularly favoured. On two nights during heavy, steady rain, a female Blackbird was found in the centre of a box bush. She was quite untouched by the rain on both these occasions. An exceptional roosting place occupied by a male Blackbird in October, 1938, was an old nest of its own species. It was in a comparatively open position, being near the top of a hedge about 3 ft. from the ground. The weather conditions however, were good ; there was little wind and no rain.

On several occasions in March, pairs were found roosting within a few feet of one another, but in most cases they were found singly. An exceptional case of Blackbirds roosting gregariously with Starlings was in a reed-bed with a number of rhododendrons.

ROBIN (*Erithacus r. melophilus*).

Robins appear to prefer fairly dense cover in which to roost ; most individuals observed have been in thick yews or laurel bushes and a fairly large number have been found in ivy covering trees or stumps. The height usually chosen for roosting varied between about 4 ft. and 8 ft. from the ground.

Those birds found asleep had the head tucked into the scapulars and the feathers of the breast and flanks fluffed up to a moderate extent ; but nothing like so much as in the case of the two species of tits.

The wakefulness and liveliness of the individuals varied somewhat, but in every case when a bird was a sound sleeper it was not lively when woken, while with a light sleeper it was the opposite. On the whole, Robins were found to be light sleepers and every one was eventually woken by the light of a torch or noise made in approaching. About 60% of them were awake when found and these all deserted their roosting places when slightly disturbed.

Unfortunately, no Robins were found in wet weather and, regarding their reactions to weather conditions, we can only say that wind seemed to have little effect upon the choice of a roosting site.

WREN (*Troglodytes t. troglodytes*).

A comparatively large number of roosting sites have been found occupied by Wrens, but the type of places most frequently chosen appeared to be shallow holes in haystacks. Other roosts quite commonly occupied were old nests of their own species and disused scrapings of Tree-Creepers. Perhaps the most interesting roosts that were found were a newly started Great Spotted Woodpecker's nesting hole on the underside of a rotten beech branch and the foundations of a Long-tailed Tit's nest still under construction. A Wren was found in the latter on two nights, but on the first it was woken after some time by noise and the light of a torch and on the second it was very wakeful and flew from its roosting place as soon as a light was shone on to it. This degree of wakefulness and liveliness has been the case with almost every individual observed; on the first time of finding they have only been woken after some while by considerable noise or light, but on their return to the same roost they have been easily woken and frightened away.

On many occasions, two or more Wrens have been found roosting together, but from February onwards they were found most frequently in pairs. Consequently, single birds, trios and more were seldom found during this season. However, on one occasion as late as March 7th, three Wrens were found roosting together in an old nest of their own species. During the early winter the number of individuals roosting together varied considerably. In January and early February, the numbers fluctuated between two and four of those found roosting in haystacks, but on February 1st, 1939, nine individuals were found together in an old Song-Thrush's nest. This was situated under the eaves of a low farm building and was about 4 ft. 6 inches from the ground. The gap between the

top of the nest and the roofing tiles was only about an inch, but the outside birds could be seen fairly plainly : they were all roosting with the tails pointing upwards and outwards, but the position of their heads could not be seen. They were all very heavy sleepers and only by inserting a hand into their midst could they be made to fly out. In this way it was



WREN roosting in dis-used scraping of Tree-Creeper in *Sequoia gigantea*.
(Photographed by C. C. Doncaster.)

possible to count at least nine individuals as they escaped, but there may have been one or two more unnoticed. The weather on this occasion was not particularly cold and the minimum temperature for the night was 31°F.

The manner of roosting varied slightly according to the roost chosen. Those occupying disused scrapings of Tree-Creepers took up very much the same attitude as these

birds, though the tail always tended to stick out rather than be used as a support. Those roosting in nests or holes in haystacks appeared very much more like Blue Tits or Coal-Tits: the head seemed to be tucked into the scapulars lower down the back and the body was in a horizontal position.

GREEN WOODPECKER (*Picus v. pluvius*).

On three consecutive nights in March, 1938, a Green Woodpecker was found roosting in a hole about 15 ft. up the trunk



GREEN WOODPECKER roosting in cavity of a beech-tree.
(Photographed by C. C. Doncaster.)

of a beech. The hole had been occupied previously by great bats, but these had deserted it some while before : it was a long oval hole, about a foot in length and extending up inside the tree for about the same distance. On the first night, we found the Woodpecker awake in its roost and on shining a light into the hole the bird attempted to climb higher and out of sight. In a few seconds it gave this up and remained more or less motionless. On the second night the bird was found asleep and though two flash-light photographs were taken of it, it did not wake. Its position in the hole was similar to that of the previous occasion. The third time it was visited it was once again found to be awake and on this occasion it flew from its roost and did not return.

The manner of roosting is obscure, as it was not possible to see the position of the head. It does appear, however, that the head is not buried in the scapulars. The feathers of the nape were seen to be raised, as if the head were bent forward and possibly tucked under the wing. Very little fluffing up of the body-feathers was observed.

RECOVERY OF MARKED BIRDS

COMMUNICATED BY

E. P. LEACH.

Hon. Sec. Bird-Ringing Committee, British Trust for Ornithology.

No.	Ringed.	Recovered.
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Raven (*Corvus c. corax*).

RINGED AS NESTLINGS.

- | | | |
|--------|---|--|
| 404247 | Sedbergh (Yorks), 14.5.39,
by Sedbergh School. | Malham Moor (Yorks), Winter,
1940-1941. |
| 405398 | Llangurig (Mont.), 17.4.41,
by W. A. Cadman. | Llangollen, (Denbigh) 9.9.41. |
| 404749 | Ditto | 17.4.41. Corwen (Merioneth), 10.10.41. |

Rook (*Corvus f. frugilegus*).

- | | | |
|---------|--|------------------------|
| RT.6946 | Guiseley (Yorks), 21.4.34,
young, by C. Wontner
Smith. | Where ringed, 25.8.41. |
|---------|--|------------------------|

Jackdaw (*Corvus m. spermologus*).

- | | | |
|---------|--|------------------------|
| RS.1765 | Perth, 24.5.32, young, by
Lord Mansfield. | Where ringed, 24.5.41. |
|---------|--|------------------------|

Starling (*Sturnus v. vulgaris*).

RINGED AS FULL-GROWN.

- | | | |
|--------|---|--|
| TN.15 | Ackworth (Yorks), 2.2.40,
by A. Darlington. | Northampton, 9.1.41. |
| TN.162 | Ditto | 17.2.40. Kristinehamn (Värmland),
Sweden, 27.10.40. |
| TR.52 | West Didsbury (Ches),
11.2.40, by E. Cohen. | Bishops Stortford (Herts),
21.3.41. |
| TN.948 | Evesham (Worcs), 16.2.40,
by A. Harthan. | Oving (Bucks), 28.12.40. |
| TN.950 | Ditto | 16.2.40. Great Glemham (Suffolk),
25.1.41. |
| WD.695 | Ditto | 24.12.38. Rangeworthy (Glos), 23.4.41. |
| WJ.961 | Malvern (Worcs), 25.6.39,
by P. Morshead. | Keynsham (Somerset), —.1.41. |
| WJ.578 | Ditto | 3.2.39. West Hagbourne (Berks),
2.12.40. |
| WT.22 | Ettington (Warwick),
10.3.39, by C. A. Norris. | Weston-super-Mare (Som),
—.12.40. |
| XE.69 | Charlbury (Oxon), 29.12.37,
by Oxford O.S. | Plymouth (Devon), 13.1.41. |
| YS.520 | West Lavington (Wilts),
14.11.37, by Dauntsey's
School. | Herne Bay (Kent), —.6.41. |
| XV.169 | Iwerne Minster (Dorset),
31.1.39, by Clayesmore
School. | Hindhead (Surrey), —.3.41. |
| TT.690 | Ditto | 18.2.40. Cranleigh (Surrey), 16.6.41. |
| 214561 | Dungeness Lighthouse
(Kent), 14.3.39, by N. H.
Joy. | Stockholm, Sweden. 11.5.41. |

No.	Ringed.	Recovered.
Greenfinch (<i>Chloris ch. chloris</i>).		
RINGED AS FULL-GROWN.		
ZT.389	Evesham (Worcs), 14.1.38, by A. Harthan.	Birmingham (Warwick), —.2.41.
DB.265	Toddington (Glos), 15.2.39, by G. Charteris.	Bedford, —.3.41.
WS.516	Southall (Middx.), 28.1.40, by London N.H.S.	Offley (Herts), —.6.41.
WJ.213	Branscombe (Devon), 27.12.38, by P. Morshead.	Pershore (Worcs), 3.9.41.

Chaffinch (<i>Fringilla c. gengleri</i>).		
RINGED AS NESTLINGS.		
LA.741	Wellington College (Berks), 2.6.35, by Well. Coll. N.H.S.	Where ringed, 24.4.41.
CB.565	Godalming (Surrey), 24.5.40, by Charterhouse B.C.	Windsor (Berks), —.3.41.

Blue Tit (<i>Parus c. obscurus</i>).		
CD.157	Oxford, 28.11.40, ad., by Oxford Orn. Soc.	Weston-on-the-Green (Oxon), 18.5.41.
CB.15	Horsham (Sussex), 6.3.40, ad., by Christ's Hospital N.H.S.	Winchester (Hants), 7.2.41.

Whitethroat (<i>Sylvia c. communis</i>).		
DD.257	Hassocks (Sussex), 13.8.39, ad., by J. C. Allen.	Bristol, 14.6.41.

Mistle-Thrush (<i>Turdus v. viscivorus</i>).		
AS.7387	York, 17.6.39, young, by Bootham School.	Doncaster (Yorks), 6.2.41.
227604	Sway (Hants), 11.5.41, young, by E. Cohen.	Tidworth (Hants), 15.9.41.

Song-Thrush (<i>Turdus e. ericetorum</i>).		
RINGED AS NESTLINGS.		
TA.509	Rhu (Dumbarton), 30.4.40, by Rugby School.	Broughshane (Antrim), 19.1.41.
TE.772	Penrith (Cumb), 13.6.39, by Moon and Cooper.	Skibbereen (Cork), 10.1.41.
YM.832	Askham (Westmor), 25.4.39, by Moon and Cooper.	Clonmel (Tipperary), —.12.40.
XN.287	Hackthorpe (Westmor), 28.4.38, by Moon and Cooper.	Newtown Butler (Fermanagh), —.1.41.
WS.698	Pontefract (Yorks), 2.5.39, by A. Darlington.	Conisborough (Yorks), 3.7.41.
FT.489	Evesham (Worcs), 29.5.34, by P. Morshead.	Where ringed, 7.5.41.
TW.146	Reading (Berks), 15.4.40, by Leighton Park Sch.	Stourpaine (Dorset), 15.12.40.

Song-Thrush (*continued*).

No.	Ringed.	Recovered.
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RINGED AS FULL-GROWN.

- | | | |
|--------|---|-------------------------------|
| WW.134 | Arnside (Westmor), 2.1.40,
by J. Barnes. | Kinsale (Cork), 20.1.41. |
| TN.765 | Evesham (Worcs), 21.1.40,
by A. Harthan. | Earslwood (Warwick), 12.4.41. |

Redwing (*Turdus musicus*).

- | | | |
|-------|---|--|
| WL.53 | Penryn (Cornwall), 11.1.39,
ad., by P. Maclaren. | Pordenone (Venezia) Italy,
4.11.39. |
|-------|---|--|

Blackbird (*Turdus m. merula*).

RINGED AS FULL-GROWN.

- | | | |
|--------|--|-----------------------------------|
| TL.185 | Duffus (Elgin), 25.1.40, by
Gordonstoun Sch. | Deskford (Banff.), 18.4.41. |
| XB.957 | Whipsnade (Beds), 5.1.39,
by Zool. Soc. | Shefford (Beds), 3.2.41. |
| TH.748 | Woodford Green (Essex),
27.1.40, by London,
N.H.S. | Portpatrick (Wigtown),
7.2.41. |
| TN.641 | Belfast N. Ireland, 14.2.40,
by J. Cunningham. | Keighley (Yorks), 18.12.40. |

Redstart (*Phænicurus ph. phænicurus*).

- | | | |
|--------|--|------------------------|
| MH.606 | Stocksfield (Northumb),
27.6.36, young, by H.
Tully. | Where ringed, 23.5.40. |
|--------|--|------------------------|

Swallow (*Hirundo r. rustica*).

- | | | |
|--------|---|--|
| DP.107 | King's Newnham (War-
wick), 9.6.40, young, by
Rugby School. | Grimley (Worcs), 20.8.41. |
| DT.879 | Newbold-on-Avon (War-
wick), 26.6.40, young,
by Rugby School. | Market Harborough (Leics),
16.9.41. |

Kingfisher (*Alcedo a. ispida*).

- | | | |
|--------|--|------------------------------------|
| DC.704 | Wilmslow (Ches), 28.5.39,
young, by E. Cohen. | Northallerton (Yorks),
31.3.41. |
|--------|--|------------------------------------|

Great Spotted Woodpecker (*Dryobates m. anglicus*).

- | | | |
|--------|--|------------------------------------|
| R.4261 | Stocksfield (Northumb),
16.3.33, ad., by Mrs.
Hodgkin. | Every Spring up to March,
1941. |
|--------|--|------------------------------------|

Cuckoo (*Cuculus c. canorus*).

- | | | |
|--------|--|----------------------------|
| 210751 | Henley-on-Thames, 5.6.40,
young, by G. Charteris. | Toddington (Beds), 1.7.41. |
|--------|--|----------------------------|

No.	Ringed.	Recovered.
Merlin (<i>Falco c. aesalon</i>).		
314382	Rothbury (Northumb), 24.6.39, young, by Mrs. Hodgkin.	Seaton Delaval (Northumb), 8.2.41.
RV.4144	Ditto	24.6.39. Gill Pyke (Northumb), 13.6.41.
Kestrel (<i>Falco t. tinnunculus</i>).		
RT.1758	Buckden (Yorks), 19.6.38, young, by T. Kerr.	Kirkham (Lancs), -11.39.
313902	Thursley (Surrey), 15.6.40, young, by London N.H.S.	Cortes (Navarra), Spain, 14.12.40.
Buzzard (<i>Buteo b. buteo</i>).		
AC.7475	Bossington (Somerset), 18.6.41, young, by A. E. Billett.	Freeland (Oxon), 27.8.41.
Hen-Harrier (<i>Circus c. cyaneus</i>).		
AC.3367	Orkney, 13.7.38, young, by P. Russell.	Wick (Caithness), 12.8.41.
Heron (<i>Ardea c. cinerea</i>).		
RINGED AS NESTLINGS.		
502667	Chester, 27.4.41, by G. K. Robinson.	Fairford (Glos), —.8.41.
502601	Chettisham (Cambs.) 26.5.40, by P. Maclaren.	Ufford (Northants), 17.1.41.
22067	Walland Marsh (Kent), 28.4.40, by Brooker & Cawke.	Uckfield (Sussex), 17.1.41.
113272	Beckley (Sussex), 26.5.34, by P. Hollom.	Ashenden Heronry (Kent), 9.5.41.
502578	Antrim, 5.6.40, by M. & D. Rankin.	Rockcliffe (Cumb), —.2.41.
501790	Ringdufferin (Down), 9.6.40, by V. H. Spry.	Tarbert (Argyll), 7.12.40.
Mallard (<i>Anas p. platyrhynchos</i>).		
RINGS ISSUED TO WILDFOWL INQUIRY COMMITTEE.		
925586	Loch Spynie, Elgin, 23.2.39, ad.	Millfield (Northumb) 31.1.41.
925130	Abbotsbury (Dorset), 20.12.38.	River Dvina, Archangel Province, Russia, 15.9.40.
Teal (<i>Anas c. crecca</i>).		
RINGED AS YOUNG.		
302875	Wolsingham (Durham), 1.7.40, by R. Martinson.	Burgh-by-Sands (Cumb), —.1.41.
315578	Andreas, I. of Man, 3.7.39, by Manx F. C.	Northampton, 26.2.41.
321364	Ditto	5.7.40, Newtown Butler (Fermanagh), 23.1.41.
321358	Ditto	30.6.40. Oviedo (Asturias) Spain, 16.1.41.

Teal (*continued*).

<i>No</i>	<i>Ringed.</i>	<i>Recovered.</i>
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RINGED AS FULL-GROWN.

RT.9868	Leswalt (Wigtown), 11.2.38, by J. Law.	Osea Island (Essex), 6.2.41.
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RINGS ISSUED TO WILDFOWL INQUIRY COMMITTEE.

900452	Dilham (Norfolk), 16.11.38.	Dunmanway (Cork), 20.2.41.
900425	Abbotsbury (Dorset) 20.12.38	Dorchester, 26.11.40.
902512	Ditto 3.1.40.	River Mezen, Archangel Province, Russia, 17.5.40.
900404	Ditto 20.12.38.	Leningrad Province, Russia, 11.5.40.
902139	Pembroke, 5.1.39.	Cound (Salop) —.2.41.
900803	Ditto 3.1.40.	Dunham-on-Trent (Notts.), 26.12.40.
901443	Ditto 4.12.38	Kingsbridge (Devon)—.1.41.
902373	Ditto 27.9.39.	Mouth of R. Dovey (Cards), 2.10.41.
900585	Ditto 2.12.39	Moone (Kildare) —.1.41.
900675	Ditto 22.12.39.	Banagher (King's Co.), 8.1.41.
900503	Ditto 9.11.39.	Charlestown (Kilkenny), 6.2.41.
902428	Ditto 12.10.39.	Cratloe (Clare), 1.3.41.
902343	Ditto 21.9.39	Kildysart (Clare), —.1.41.
902239	Ditto 28.1.39.	Killarney (Kerry), —.3.41.
901809	Ditto 14.12.38	Little Island (Cork), 4.12.40.
902128	Ditto 5.1.39.	Kholmogori, Archangel Province, Russia, 25.8.39.
901561	Ditto 8.12.38.	Strensele, Swedish Lapland, 2.5.40.
900933	Ditto 2.2.40.	Skelleftea (Västerbotten), Sweden, —.9.40.
900859	Ditto 6.1.40.	Kallandsö (Västergötland), Sweden, 8.9.40.

RINGS OF THE ORIELTON DECOY, PEMBROKE.

511	13.12.35	Chirbury (Salop), 23.1.40.
2420	18.11.37	Seaford (Sussex), 21.1.40.
3183	11.1.38.	Tawstock (Devon), 10.1.40.
1903	29.12.36.	Boho (Fermanagh), 19.1.40.
1163	20.10.36.	Lough Forbes (Longford), 27.2.40.
1230	31.10.36.	Co. Meath, 25.2.40.
2388	18.11.37.	R. Inney (Westmeath), 26.2.40.
2488	19.11.37.	Enniscorthy (Wexford), 24.2.40.
3063	3.1.38.	Rosslare (Wexford), —.1.40.
609	20.12.35.	Skelleftea (Västerbotten), Sweden, 14.8.40.

[To be continued.]

SOME CENSUS WORK ON THE CORN-BUNTING

BY

H. A. COURSE.

DURING the period, May 8th to June 2nd, 1938, I made a count of singing males of the Corn-Bunting (*Emberiza calandra*) and the following information is taken from notes made at the time.

GENERAL NOTES.

The area chosen was exactly six square miles of country on the borders of Hertfordshire and Cambridgeshire and was based on the six inch Ordnance Survey map ; Cambridgeshire Sheet LVIII.S.W. (1903). This is a chalk country with no streams or surface water at all, and altitudes ranging between 120 and 420 feet. The southern part is mainly hilly and in the north the land slopes gently down towards the valley of the Cam. The market town of Royston (Pop. 4,000) is in the area and it has a close core with the usual gardens and allotments round it, the whole totalling just over half a square mile. This is a great corn growing district and the four square miles of arable land within the area has corn crops predominating. In the northern part, which is mainly arable, there are mostly hedges between the fields and many of these had been trimmed down to less than two feet high. In the south-east a fair proportion of the hedges are replaced by strip plantations. The weather during the count was mostly fine, dry, cool and at times windy.

Margin of Error.

The birds were in possession of territory and were in full song. Most of the work was done between 6.30 and 8.30 a.m. and each hedge was followed along. The margin of error was certainly not more than 10% and was probably within 5%.

Statistics of the count.

The result of the count gave 72 singing males in the whole area, whose singing stations were situated as follows :—

In the hedgerows of the arable land	...	60
On the borders of the arable and non- arable land	... ..	11
On non-arable land	... ..	1

For the purpose of more detailed analysis I have divided the area into six sections of one square mile each.

SECTION A. North-west. No habitations, fairly flat.
100% Arable 15 birds.

SECTION B. North
75% Arable
5% Pasture
20% Urban with gardens 17 birds.

SECTION C. North-east.
75% Arable
15% Pasture
10% Urban with gardens 21 birds.

SECTION D. South-west. Hilly.
50% Arable
5% Pasture
35% Public downland with golf course
10% Mixed woods 9 birds.

SECTION E. South. Hilly.
35% Arable
10% Pasture
35% Public downland with golf course
20% Urban with gardens 5 birds.

SECTION F. South-east. Fewer hedges, hilly.
65% Arable
10% Pasture
10% Woods and strip plantations
15% Urban with gardens 5 birds.

It will thus be seen that although the species is found over the whole area (except in the urban part), it is strongest in the flat arable land with hedges and few trees.

By sharing the birds on the borders of arable and non-arable land, the approximate densities in each type of country were :—

Total area	...	...	6 sq. miles	72	birds	12	per sq. mile
Arable land	...	...	4 " "	65.5	"	16.5	" " "
Pasture and downland	...	...	1 $\frac{1}{6}$ " "	6.5	"	5.5	" " "
Woodland and urban	...	...	$\frac{5}{8}$ " "	No	birds	—	— — —

NOTES

STARLINGS TAKING RUBBER BANDS.

THERE is a large roost of Starlings (*Sturnus v. vulgaris*) in young larches and laurel bushes in a wood known as the March Covert at Lockington on the extreme northern boundary of Leicestershire. After the birds had departed it was noticed that the ground was, and still is, literally covered with rubber bands mingled with the droppings. They may have been carried by the birds in their beaks and dropped to the ground as they settled to roost. This seems unlikely. Otherwise they may have been swallowed and later vomited to the ground or they may have passed through the digestive tract unaffected by any secretions. There appeared to be no preference for any size or colour of band. In a casual collection of about 200 there were black, red, blue, green, yellow and brown bands. The great majority were of the common tawny colour probably because they are the most abundant. A large number were of the flattened type about $\frac{1}{4}$ inch wide and 3 inches diameter. Many were of the type used in fruit bottling and others were from canned goods, tobacco tins, etc. Whatever may have been their object the birds have certainly succeeded in amassing a good dump of rubber. A. ROEBUCK.

[The taking of rubber bands by Starlings, Arctic Terns and Gulls has been recorded by Mr. G. C. S. Ingram and Lt.-Col. H. M. Salmon (*antea*, Vol. xxx, pp. 374-5) and by Miss A. Hibbert-Ware in the case of Rooks (Vol. xxiv, p. 27). It seems probable that the birds mistake them for food and that they are afterwards ejected as indigestible.—EDS.]

ORTOLAN BUNTINGS IN PEMBROKESHIRE.

A PARTY of ornithologists, under the leadership of my brother, W. B. Alexander, spent ten days on the Island of Ramsey, by courtesy of Mrs. Whitehead, in the middle of September, 1941, to observe migration.

On the morning of September 20th, I noticed a bird sitting on a wall a few yards from me which superficially resembled a Meadow-Pipit, but it had the beak of a Bunting. I was also struck by the long pale stripe down each side of the throat, the throat itself—or at least the chin—being brown or grey; the bill and legs were pink. When the bird flew from the wall into some bracken it was joined by a second bird of the same kind and as they flew I noticed their white outer tail-feathers.

The other members of the party also had very good views

of these two birds a little later and noticed the features already mentioned. We also found a bird which was the only one that showed the orange tinge on the breast so characteristic of the Ortolan in summer plumage. The whitish rim round the eye was conspicuous in all three.

Two at least were present the following day, and it is probable that one at least had been observed on the 18th and 19th. They were not seen after the 21st. Their call-notes were heard fairly frequently.

Although there can be no doubt that all three birds were Ortolan Buntings (*Emberiza hortulana*) I have deliberately given the description of the special features noticed on the first of the three birds (and in fact all three showed dark colour on the chin and the pale stripes down the sides of the throat), as these features of the Ortolan in autumn plumage do not seem to agree exactly with the field-characters given in the *Handbook*.

Dr. N. F. Ticehurst's observations on Bardsey in 1913 and Mr. Lockley's recent observations at Skokholm, coupled with this last observation, seem to suggest that the Ortolan may be a fairly regular passage migrant on the Welsh islands.

H. G. ALEXANDER.

WAXWINGS IN ABERDEEN AND SKYE.

ON November 5th, 1941, while I was crossing a piece of waste ground on the outskirts of Aberdeen, my attention was attracted by an unfamiliar tinkling sound, which I likened in my mind to a lot of little bells. A moment later a flock of 10-12 birds came over the roof of a shed near by and settled in a small tree beside me. I could then see their crests, and immediately recognised them as Waxwings (*Bombycilla g. garrulus*). After chattering there for a minute or so they flew on down a neighbouring street.

A. M. GWYNN.

ON November 7th, 1941 my wife and I watched four Waxwings in the north of Skye, one was standing on the road and the others were feeding greedily on the red fruit of a hawthorn tree. The berries were swallowed whole.

SETON GORDON.

DISPLAY OF BLACKBIRDS.

I HAVE often observed a sort of formal display between cock Blackbirds (*Turdus m. merula*) on my lawn in Cheshire (cf., *antea*, pp. 54 and 107). I first noticed it on March 1st, 1933, when three cock birds with tails fanned and depressed moved about in triangular formation for at least half-an-hour.

Although from time to time one would make a half-hearted dart at another it quickly took its place again at the same interval as before, and these intervals were maintained as the triangle turned first one way and then another. Sometimes four cocks take part in these displays, which my wife and I have seen so often that I have failed to keep a proper record of their frequency. I have seen three cocks acting in this way as late as April 23rd. Sometimes, but not always, a hen is present, but it never pays any attention to the performance.

This formal display, which resembles a sort of drill movement, differs greatly from the more emphatic display I saw between two cocks and a hen on February 27th, 1937. A cock with neck stretched out and head down near the ground, and with tail widespread flat to the ground like a fan, raised its tail at right angles, still widely fanned, as it ran beside a hen. The hen ran about with tail erect. Another cock came up to the hen on the other side and did much the same, but did not spread its tail so wide. The two cocks never came to blows, though the first one looked rather threatening with its chin near the ground. The display came to an end when the original cock stopped, pulled up and ate a worm and appeared to be ready to drive the hen off if it came too close. As early as February 8th, 1940 a cock and hen followed one another in small circles with fanned tails sweeping the ground and wings half spread and depressed. Coition took place on this occasion.

A. W. BOYD.

AERIAL DISPLAY BY A PAIR OF GOLDEN EAGLES.

THE note upon this subject by Miss W. M. Ross (*antea*, pp.82-83) throws into significance for me a note I made on August 29th, 1941, on a similar display by two Golden Eagles (*Aquila ch. chrysaëtus*), witnessed over a secluded west Aberdeenshire glen. Not long after some deer had moved up a corrie in which I was, off the main glen, a Golden Eagle drifted over to investigate. After circling two or three times it commenced to soar, and spiralled up to a fairly high altitude, when it swooped rapidly away from me across the glen. At a mile or more from me it was joined by a second Eagle from the hills opposite, and as I watched through binoculars the two began to circle round each other. Presently one bird made a stoop at the other, after which the bird upon which the stoop was made immediately turned over in mid-air and "tumbled," much in the manner of Rooks at play. This was done several times, a short chase sometimes taking place. They continued circling and stooping, without any appearance of hostility, until they drifted out of sight. It was noticeable that while

this was happening the wings were flapped much more than in ordinary progress. Because of their great distance off, I could not see the display in such detail as Miss Ross describes, but the whole performance was distinctly unusual and was probably the same. KENNETH A. WOOD.

FIRST SUCCESSFUL BREEDING OF THE FULMAR IN ISLE OF MAN.

FOLLOWING the first record of definite breeding of the Fulmar (*Fulmarus g. glacialis*) in Cumberland (*antea*, p. 61) this year (1941) also saw the first successful breeding of the species in the Isle of Man.

Previously no eggs had ever been found on the coast of the Island (although an egg was seen on the Calf in 1936). This year a careful count at Kione ny Ghoggan revealed 12 pairs in May and no fewer than four of these laid eggs although two pairs deserted before the eggs hatched. On July 22nd the writers found a young Fulmar on a ledge and a second was found here on August 3rd. On August 14th, Mr. and Mrs. W. S. Kennedy and W. S. Cowin also found a well-grown Fulmar at the Castle Rocks. All three birds were closely watched until they left the ledges, the last being seen there on August 31st and there can be no doubt all three were successfully reared. This is the first time that successful breeding has been proved in the Isle of Man.

W. S. COWIN AND B.R.S. AND E. M. MEGAW.

FIRST BREEDING OF FULMARS ON AYRSHIRE MAINLAND.

DURING a fortnight's stay in Ayrshire, from May 17th to 31st, 1941, I observed Fulmars at Bennane Head on about six separate occasions. There were never more than six pairs in all present at any one time, and six birds appeared to be sitting on or about nests. Unfortunately I only succeeded in reaching one nest, which contained an egg on May 27th.

The cliff at Bennane Head is roughly 100 ft. above sea level, and the Fulmars are nesting from 10 to 20 feet from the top. The main road runs below the nesting sites, about 20 feet from sea level.

I am making enquiries as to whether Fulmars have been seen here in previous years. IAN ROBERTSON.

SCANDINAVIAN HERRING-GULL IN YORKSHIRE.

As so few examples of the Scandinavian Herring-Gull (*Larus argentatus omissus*) are known to have occurred in Great Britain (*vide Handbook*, vol. v., p. 96) it is of interest to record

that a Herring-Gull with a Moscow ring (D.69266) was shot in the suburbs of Leeds on February 16th, 1940. The information was sent by Mr. Holroyd, of Leeds, to the Editor of *The Shooting Times* who passed it on to me. I have just received information from the Central Bureau for Bird-Ringing in Moscow that this bird was ringed in July, 1939 on Kharlov Island, off the Murmansk coast and was therefore I presume an example of this form. E. P. LEACH.

DURATION OF LIFE OF ARCTIC SKUA.

IN 1933 (*antea*, Vol. xxvii, p. 139) reference was made to an Arctic Skua (*Stercorarius parasiticus*)—believed to be a female—which had lived on the Isle of Foula for twenty-three summers and was identified by its small size and great tameness. Since then my friends on Foula have told me year by year of the punctual return in spring and the subsequent nesting of "the little Skua." This year (1941) the bird came back at its usual time, but later in the summer it met with an accident and was found dead with a broken wing near its nest. Its partner continued to incubate the eggs, but after a week it secured another mate.

It seems clear therefore that (a) the Arctic Skua has a potential duration of sexually active life of 31 years—and (b) that if one bird of a pair loses its mate, it may attract another although family cares are far advanced.

CHAS. OLDHAM.

SKY-LARK SINGING CONTINUOUSLY FOR EIGHTEEN MINUTES.—Mr. H. G. Alexander informs us that on June 15th, 1941 in North Worcestershire he listened to a Sky-Lark (*Alauda a. arvensis*) which sang continuously for 18 minutes or a few seconds less, suspended in almost the same spot. Although to casual observation, a Sky-Lark may often give the impression of singing continuously for long periods a completely uninterrupted song lasting much over five minutes is in our experience and that of Mr. Alexander quite exceptional.

CORMORANT PERCHED ON A TELEGRAPH WIRE.—Mr. H. G. Alexander writes that on April 1st, 1941 he saw near Bridgwater, Somerset, a Cormorant (*Phalacrocorax c. carbo*) sitting on a telegraph wire where it seemed quite comfortable and did not sway, or flap or open its wings.

SPOTTED REDSHANK IN HERTFORDSHIRE.—Mr. Roger Harkness writes that on the afternoon of October 6th, 1941, he obtained excellent views of a Spotted Redshank (*Tringa erythropus*) feeding on the mud at Marsworth Reservoir, Tring, with Lapwings and Snipe.

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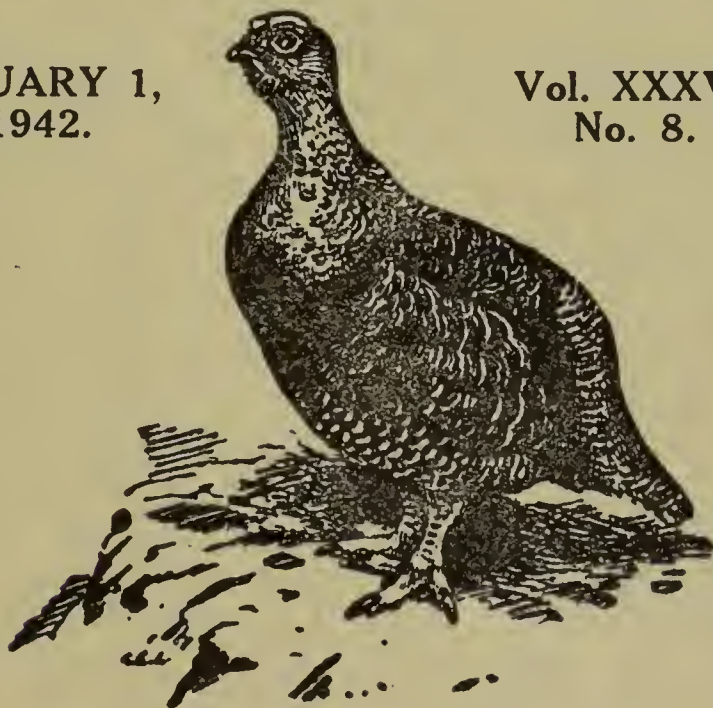
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ASSISTED BY

NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U., AND

BERNARD W. TUCKER, M.A., F.Z.S., M.B.O.U.

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EGG-SHELL DISPOSAL BY BIRDS

BY

CAROLINE AND DESMOND NETHERSOLE-THOMPSON.

It is becoming increasingly clear that the period of hatching during which the young birds are chipping through and later emerging from their imprisoning cradles is not only peculiarly rich in interest and incident, but one that deserves the most careful study by those interested in breeding-biology. So completely indeed may the behaviour of some birds then change that it is reasonable to assume that a form of emotional crisis occurs before the incubation drive merges into the impulse to tend the young.

In this paper, however, we are primarily concerned with a single facet of the "hatching-complex", namely, the means adopted by various birds in disposing of the discarded egg-shells and the behaviour therewith connected.

The basis of this account, and a great many of the observations contained in it, rest upon our own field work, but no two observers, however keen and painstaking, could reasonably expect to cite personal observations on the egg-shell-disposal practices of almost every bird that breeds in Britain. We have constantly endeavoured, therefore, by consultation and correspondence, not only to fill in the gaps in the story, but to supplement with those of others our own data wherever these were inadequate. In particular we should like to express appreciation for the help and valuable information given to us by the following observers:—

George Arthur, C. E. Baker, W. P. B. Beal, the Duke of Bedford, C. J. Bellamy, E. Bowser, G. Charteris, Ralph Chislett, W. M. Congreve, the late John Douglas, J. Hamilton, F. B. Kirkman, R. M. Lockley, W. Marshall, W. McNicol, the late Percy Meeson, D. W. Musselwhite, J. H. Owen, O. R. Owen, T. L. Patey, C. V. Stoney, D. Stubbert, G. Tomkinson, Nat. Tracy, Jim Vincent, R. Ware, A. Whitaker and J. Baldwin Young.

We also express our gratitude to Miss Frances Pitt and Messrs. John Markham and E. J. Hosking for kindly allowing us to use their interesting photographs and for a number of valuable notes to which we refer in the systematic list.

It is not claimed that we ourselves have examined all the sparse and scattered literature on egg-shell disposal, as research of that kind is only possible to those who either possess or have access to a large library, but we have carefully noted and abstracted any important data that we have read.

After this paper had been written, however, an opportunity was given to us of consulting a journal belonging to the late E. B. Dunlop, which is now the property of the Edward Grey Institute of Field Ornithology. This journal contains careful and original observations on the shell-disposal usages of some thirty species and to this account, our old friend, the late F. C. R. Jourdain, added not only some field observations of his own, but a large number of references gleaned from British, American, and Continental literature. In addition, Mr. H. F. Witherby kindly placed at our disposal the results of Jourdain's literary researches from 1937 onwards which are incorporated in his note books on breeding-biology. We wish therefore, gratefully to acknowledge these important sources of information, which have enabled us to give a fuller and better balanced account than would otherwise have been possible.

Owing to the extremely limited period during which actual disposal of the egg-shell occurs opportunities for making direct observations, by comparison with, say, those on the nest-sanitation habits, are disappointingly few. Much laborious watching is, therefore, necessary, and, in addition, the presence or absence of egg-shells in the nests should always be recorded and whenever a hatched egg-shell is found—whether close to or far from the nest—it should be carefully noted. In this way a mass of indirect evidence supplements a smaller amount of more exact and precise data. It seems hardly necessary to add, however, that this is essentially a preliminary paper, containing many gaps, and, as will readily be seen, the evidence and factual data concerning the various species varies both in quantity and quality. Yet it is hoped that despite its limitations it may stimulate other field-workers to devote attention to this complex and fascinating problem, and that perhaps it may provide a nucleus upon which a fuller and more complete account may be written in the future. With this in view, we shall be most grateful to any who may care to send us further data on the subject.

Before analysing our data, let us briefly consider the general principles underlying egg-shell disposal. It is obvious, of course, that much work, on experimental as well as on natural lines, will be necessary before the instinct is fully understood. Not only must we discover exactly how, when, and why the egg-shell loses its status to become a redundant, if not undesirable, body in the nest, and the part played by each sex respectively in its disposal, but we must study the relationship, if any, between nest-sanitation and shell-disposal, the

reaction of the parent towards damaged or addled eggs, and test by experiment how many birds, whether as species or individuals, automatically eject or remove egg-shells or "egg substitutes" placed in the nest at times other than hatching.

Those, then, are some of the main lines of approach, but it is not difficult to realise what a wise provision of nature it is that impels a bird to dispose of an empty egg-shell, as sharp splinters of such—as poultry keepers know so well—may injure the chicks, as well as possibly irritate the tender "brooding patch" of the parent. Many birds, therefore, as scrutiny of the appended systematic list proves, carry their discarded egg-shells, and incidentally faecal sacs as well, to some distance from the nest before dropping them. Similarly, although there is admittedly wide variation in method and practice, some hole-nesting species tend to fly away with the wood chips displaced in their excavations. In each case, however, the basic purpose seems the same, namely, to avoid leaving a clue to the location of the nest. There thus appears to be a greater tendency among colonial birds (*e.g.* House-Sparrow, Rook, Heron, auks, Cormorants, some Lari, etc.) to drop their egg-shells either close to or even actually underneath their nests than among species which rely upon concealment for safety or breed in isolation, but no such generalisation is, in fact, permissible as Wood-Pigeons and Turtle-Doves, for example, whose eggs are white and conspicuous, quite frequently eject their shells over the edge of the nest and so reveal secrets that might otherwise have been kept.

Why do some birds, even of the same species, eat their egg-shells whereas others remove them? (It may be observed incidentally that some birds—*e.g.* Common Sandpiper and Water-Rail—may first remove and then partly consume a shell, whereas Scottish Crossbills and a Montagu's Harrier (C. W. R. Knight) actually ate shells in the nest itself.) It would be most unwise, we think, to assume that there is any complete answer or formula, applicable in all cases, but we have certainly noticed that there is a greater tendency for shells to be eaten (*e.g.* Limicolæ) in very dry seasons, which in turn, suggests that the shell-remains contain something that the body lacks. Other birds (*e.g.* Hawfinch and Scottish Crossbill) possibly consume the shells because they are short of grit and, as we have often noted, some domestic fowl eagerly devour shell-fragments, and even take to eating eggs, probably for their lime content.

The possible relationship between nest-sanitation and egg-shell disposal need not be over-emphasised until we know more

about the real significances of both traits, but, whereas active sanitation is said to be "practically confined to the passerine birds (Passeriformes) and the orders which are recognised as most nearly allied to them" (*antea*, B. W. Tucker, Vol. xxxv, p. 67), active shell-disposal, on the contrary, may be practised by species (*e.g.* Limicolæ) whose young may stay only a few hours in the nest. Speculation on the origins of the two instincts, if such indeed there be, should proceed, however, along parallel lines, and some of the usages common to both practices may now be mentioned in brief—Jays, for example, not only consume the faecal-sacs of the young as long as they remain in the nest, but exceptionally return to search for and eat them even after they have flown, and the hen breaks up and eats the egg-shells (John Markham). With many small passerines, faecal-sacs of small young are at first consumed, and then carried away at a later stage. Is it not significant, therefore, that in various species among which nest-sanitation is in practice unnecessary, smaller fragments of shell may be eaten whereas the large portions are removed (*e.g.* Dotterel, Common Sandpiper, Oyster-catcher), and it is also quite possible, of course, that more passerines than are at present known to us eat small shell-fragments as well as accidentally or designedly trampling them into the nest-lining. Dippers, as we and others have seen, not infrequently rinse out their bills after the removal of excrement and this bill-rinsing has also been noted by us after shell-disposal (*e.g.* Golden Plover, Greenshank, Common Curlew, Oyster-catcher). We have also watched a hen Scottish Crossbill wipe clean her bill both after she has eaten a shell and after the consumption of faecal deposits. The main point is, however, whether birds, and, if so, which and how many, discriminate between the egg-shells and other redundant objects in the nest. We have also proved, for example, that a hen Lapwing, after an interval may carry away a pine-cone placed in the nest. Only by extensive and carefully planned experiments, however, will an answer be provided to this question.

Analogies with other forms are always dangerous, but it is not without interest that some mammals eat the placenta and consume the faeces of small young. Mr. William Marshall, for instance, has actually watched a ewe after lambing, not only consume the placenta and remove bloodstains from the lamb, but even lick the spots from the grass. This he attributes to a "throw back" to a former period when sheep had powerful natural enemies with which to contend.

How does the parent bird react to the appearance of the newly-hatched chick? The cock Common Partridge, according to Mr. E. Hosking, becomes "wild with excitement" when it first sees its chicks, but there are many other species among which the incubation impulse is so powerful that the young are actually disregarded and brooding of the empty shells continues. One hen Greenshank, for example, brooded her egg-shells for upwards of ten hours, and while so doing, picked up a shell between her mandibles and placed it in the brooding position. This was a significant action, as Greenshanks and many other ground-nesting birds besides, recover an egg accidentally knocked out of the nest by means of special body action and the underside of the bill (*e.g.* Lapwing, Oyster-catcher, Red Grouse, etc., but see particularly F. B. Kirkman: *Bird Behaviour*, x-xi, etc.) Lifting a shell between the mandibles—the normal prelude to the shell-disposal reaction—does not occur until the egg has hatched. Yet, so far from ridding herself of the shell, "manipulated" in this way, the bird proceeded to brood it. There thus seems to be some kind of recognition of the change in the egg's status, although the incubation drive is still dominant.

A second hen Greenshank still sat upon three empty egg-shells some hours after all her chicks had hatched and were ready to go forth, and all these large and small portions she later removed within a space of ninety minutes, and at another nest, when the first egg hatched, the hen for forty minutes nestled the chick, three eggs, and the large shell-fragment, which she carefully tucked beneath her, before finally lifting and flying away with it. Other Greenshanks, on the contrary, remove shells within a very few minutes of their hatching, but this difference can be explained by the assumption that a greater power of discrimination is possessed by the individual bird or by some variation in the potency of incubation-impulse as opposed to the drive by which it is succeeded.

Oyster-catchers also occasionally brood empty egg-shells for upwards of an hour before recognizing and removing them, but at three nests the cock Dotterel immediately an egg hatched, lifted the largest portions of shell on to the nest-edge, although these were not removed until half to one and three-quarter hours later, the bird gradually becoming conscious of the shell and pecking nervously at it before removal. The hatch at one of our nests was actually photographed by Mr. John Markham in June, 1940, and the sequence of events was then not only observed but fully illustrated as well.



HEN GREENSHANK with remains of egg-shell which she placed in brooding position
and continued to cover. (*Photographed by E. J. Hosking.*)

Red Grouse and Ptarmigan, as we have also proved by experiment, may actually rake in any egg-shells that have rolled out of the nest during the hatch. Miss Frances Pitt had a similar experience while filming a Curlew, and a cock Golden Plover, in July, 1940, having brooded its empty egg-shells for a considerable period, removed them, one after another, but later on nestled the empty "scrape" from which the chicks meanwhile had wandered.

A hen Scottish Crossbill, on the contrary, recognized, broke into small pieces and devoured an egg-shell within twenty minutes of its hatching, and E. Schumacher also noticed that scarcely had the second egg of a clutch of three Arctic Tern's hatched before the parent took up the shell in its bill and flew away with it to a distance, returning almost immediately afterwards with a small fish.

These selected examples thus not only help to demonstrate the power of the brooding-impulse, but the part played by the egg-shells in its satisfaction. Nor is this tendency biologically valueless. Far from it. The gap between two drives is thereby bridged and prolongation of brooding often results in the successful hatching of chicks from the later eggs. Birds which begin incubation proper on, or shortly before, clutch-completion, but cease brooding too abruptly during hatching, frequently quite unnecessarily lose chicks which were about to emerge from "chipping" eggs (*e.g.* Black Grouse and Capercaillie : personal observations).

Generalisations about bird behaviour are seldom convincing and individual variation is as great, if not greater than, as in any other phase of breeding biology that we have studied. Some of the shell-disposal peculiarities of Greenshanks, for example, have already been mentioned, but those were indeed merely pages in a varied and fascinating chapter in which we and our collaborators have been able to prove that practically every known method of disposal is employed at some time by one or other of these amazing birds. Active shell-disposal, as will have been noticed, may occur within a very short time of hatching, even after an interval of some hours in duration, or never at all. The large shell-pieces may be either pushed out. or lifted and dropped on to the edge of the nest, from which they may or may not be carried away later on. Or the bird, dispensing with these preliminaries, picks them from the nest itself and forthwith flies away with them. During these egg-removal flights—shells incidentally may be carried any distance from approximately 50 to 500 yards—the bird

normally drops the shell and flies back without having landed, but it may alight, dispense with its burden, and then return. Another bird, or indeed the same bird on another occasion, walks with the shell to a nearby pool or peat-rut, drops it in the water, and perhaps, swills out its bill before returning. Again, the shells may simply be blown away by the wind, or are completely ignored and allowed to remain in the nest-scape, and at least two different hens walked off with and ate the only shells that they actually removed. Methods of disposing of the small fragments are no less variable. These may be removed one by one in the same manner as large portions, tossed or dropped out of the nest, or over the shoulder of the sitter, buried in the lining, or entirely ignored and then unintentionally crumbled up by body-action. Moreover, the mother may or may not deliberately enlarge and break away the hole through which the chick is emerging. As to the share of the two sexes, all our evidence pointed to this being the work of the hen alone, but, in June, 1938, the cock flew away with the last egg-shell hatched in one particular nest. In the face of such extraordinary diversity in the life-history of one species, who, in their senses, would attempt to propound dogmatic generalisations?

(To be continued.)

THE LARDER OF A PAIR OF RED-BACKED SHRIKES.

BY
WILLIAM BAGGALEY.

THE following observations on a larder formed by a pair of Red-backed Shrikes (*Lanius c. collurio*) were made on Ruislip Common, Middlesex.

Three pairs of Shrikes were nesting on a part of the Common, which was half a mile in length by half as much in depth. These measurements were checked on a six-inch Ordnance Map and they were roughly confirmed.

The area was covered with thorn bushes, growing in thick clumps in some parts, and becoming more scattered or entirely isolated in other parts. There were also a few tall trees. The boundaries on all sides were clear and well defined. At each end of the area the thorn bushes ceased abruptly and gave way to grass. This marked the limits of the area to the north and to the south. The western boundary was formed by the dense thicket of Copse Wood which the Shrikes did not penetrate, and the eastern boundary was a ten foot hedge on the reservoir bank. Within this area the Shrikes nested and formed their "larders". On occasions they made extended flights beyond the eastern boundary (the hedge) on to the marshy tract of land leading to the reservoir, but subject to this exception they stayed within the limits of the ground described. They resort to the same place year after year, and in observations covering several years they have not been seen elsewhere. The individual territories occupied by each of the three pairs were carefully traced. Each pair kept to a certain spot and they were not seen to intrude in the range of each other.

The pair to which these notes hereafter relate occupied a piece of open ground dotted with small thorn bushes and facing an eastern aspect. This territory was paced out and was found to measure 230 yards by 160 yards, and in the middle of it was the larder, which measured 62 yards by 45 yards. This was also paced out.

At various times twenty-two thorn bushes were used as gibbets. The greatest number of bushes in use at one time was twelve, and a fair daily average was six to eight bushes. The total contents of the "larder" throughout the period of these observations were :—9 Whitethroats (*Sylvia c. communis*) (one week old), one juvenile House-Sparrow (*Passer d. domesticus*), upwards of 100 moths and bees, and several each

of dor-beetles, cockchafers and grasshoppers. The biggest catch on a single day was seven young Whitethroats and nine insects spiked on ten bushes on June 17th. On the same day the remains of two adult Whitethroats were found in a spot where two days previously they were seen to drive off the male Shrike.

The Shrike's method of impaling birds demonstrated the exceptional strength of such a small bird of prey. Impaling was effected on stout thorns several inches in length and the birds were run through so that the thorns protruded over an inch. Two dead birds were detached from thorns. This required a fairly strong pull, but considerable force was necessary to replace them. The birds were spiked on horizontal thorns and the insects, with few exceptions, on vertical thorns. There were only two instances (both insects) of spiking on prickles. Birds were spiked through the head or neck and in two cases through both. Insects were spiked through the thorax. Moths, with three exceptions, were spiked in their normal flying or resting positions, but the bees were spiked in many different positions. On morning visits to the "larder" the impaled moths were usually alive. Generally the catch was impaled close to the ground, as low as nine inches, but not higher than four feet. There was no spiking on the crowns of bushes, and there were no instances of spiking on adjacent thorns on the same branch. In all cases impaling was widely distributed.

The food in the "larder" appeared to be consumed and no dried-up food was found. One Whitethroat was eaten (except its legs) on the day it was caught, and three other Whitethroats were eaten by the next day. Moths usually disappeared on the second or third days, but the bees were left longer. The reason for this discrimination appeared to be clear. The moths were spiked largely in the month of June, but in July chiefly bees were spiked, when the "larder" gradually fell into disuse. On two occasions (June 15th and July 27th) the "larder" was entirely empty and on a third occasion (July 28th) only two insects remained.

A noticeable feature of the "larder" was that all the birds and nine out of ten of the insects were impaled on the eastern aspect of the bushes. This habit was not satisfactorily accounted for. The position of the nest might have afforded an explanation, but after a prolonged search it was not located. The nest was not in any of the "larder" bushes, which were thoroughly examined, but it was suspected to be in an

inpenetrable clump of brambles in the ten foot hedge. In this position the nest would have faced the "larder" at a distance of 15 yards from the nearest bush used as a gibbet. The male Shrike had a distinct use for trees and bushes of various heights and in various positions. The trees and the ten foot hedge were used for perching, observation and occasional upward flights after high-flying insects. From these positions the Shrike flew down to the low bushes either in the "larder" or in the vicinity of it. These low bushes were the Shrike's hunting posts, where it spent long periods resting on flexed legs, and where it could be approached within ten to fifteen yards. Frequent swoops were made to the ground, sometimes into the long grass, but more often on to bare patches of ground devoid of vegetation of any kind. The Shrike made some swoops to the ground and returned to its perch again within a few seconds, but generally it stayed on the ground for several minutes. The reason for these excursions was clearly due to the vast amount of insect life on the ground. Occasional sallies were made after passing moths, but dragonflies and butterflies were left alone. It is said that a Shrike perches on the top of a bush from which it swoops down on to its prey. This habit was closely observed and the Shrike was seen to use both topmost perches and lower perches according to the shape of the bushes. The higher perch was used on (a) dwarf bushes with no pronounced crowns (b) bushes with prominent central stems, and the lower perch (six inches to one foot below the top of a bush and slightly set in from the outermost branches) (c) bushes which formed a thick clump, and (d) bushes which in outline were the shape of mature trees. The explanation of the different perching positions appeared clear viz., the Shrike perched where it had a clear view of the ground below. It would not have had a clear view from the tops of bushes (c) and (d) as these bushes were greatest in width below the tops, and the overhanging branches would have interrupted the Shrike's view. Droppings amply confirmed the use of the two different positions. Throughout these numerous swoops on to the ground, the Shrike was not seen to impale anything on its return to its perch, and when the bushes were examined afterwards no insects were found. The Shrike frequently wiped its bill against a branch, but whether this action was for the purpose of killing insects, or just cleaning its bill could not be seen.

Sixteen visits were paid to the territory on June 13th to 18th and 23rd and 29th and on July 3rd, 17th, 20th, 21st,

23rd, 24th, 27th and 28th either between 10 a.m. and 12 o'clock noon, or between 7 p.m. to 9 p.m. (Two hours Summer Time Order in force). Records were made on each of the sixteen visits.

Complete and precise observation was not always possible for several reasons. On fine evenings and at week-ends there were too many people on the Common. Binoculars were also not used, for reasons which will be familiar to bird watchers generally at the present time. Many details are therefore missing from these notes, which would otherwise have been given. The male Shrike was seen throughout the whole of the sixteen visits, but the female was only seen on the first three and the last two visits. Three young were first seen on July 17th, when they were perched on a strand of barbed wire, and were fed by the male.

Reference was made at the commencement of these notes to three pairs of Shrikes, including the pair whose "larder" has been described. Casual observation of over one hundred bushes in the territories of the other two pairs revealed no signs of the formation of "larders," but each of these pairs reared two young. One half of the bushes used in the "larder" were dead, *i.e.* they were decayed bushes, in contrast to those which had been killed by heath fires. The latter were not used. The remainder of the "larder" bushes were very backward in growth, and some of them were not in full leaf until the middle of July. For these reasons observation of the "larder" contents was easy.

RECOVERY OF MARKED BIRDS

COMMUNICATED BY

E. P. LEACH.

Hon. Sec. Bird-Ringing Committee, British Trust for Ornithology.

(Concluded from page 153.)

No.	Ringed.	Recovered.
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Wigeon (*Anas penelope*).

RINGED AS FULL-GROWN.

900241	Dereham (Norfolk), 26.1.38, for Wildfowl Inquiry Committee.	River Neiva, Perm Province, Russia, 15.5.40. [57° 45' N, 60° 20' E].
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RINGS OF THE ORIELTON DECOY, PEMBROKE.

3629	19.11.38.	Isle of Sheppey (Kent), 24.1.40.
3480	28.9.38.	Tuam (Galway), 28.2.40.
4006	8.2.39.	Serov, Perm Province, Russia, 16.5.40. [59° 20' N, 61° 00' E.]
4133	8.11.39.	River Kolva, Perm Province Russia, 11.5.40. [60° 45' N, 56° 45' E.]
3719	20.12.38.	Narian-Mar, Archangel Province, Russia, —.6.40.
3700	19.12.38.	Ameland, West Frisian Is. —.10.39.

Pintail (*Anas a. acula*).

RINGS OF THE ORIELTON DECOY, PEMBROKE.

1560	29.11.36.	Banagher, (King's Co.), 2.1.40
3659	6.12.38.	Dungarvan (Waterford), 17.2.40.
3865	9.1.39.	Omsk, Western Siberia, 19.4.40. [55° 30' N, 71° 30' E.]
3870	11.1.39.	Petchora River, Archangel Province, Russia, 8.6.40.

Shoveler (*Spatula clypeata*).

RINGS OF THE ORIELTON DECOY, PEMBROKE.

3667	7.12.38.	Ringwood (Hants), 2.1.40.
3587	14.11.38.	Yarmouth, Isle of Wight, 8.2.40.
3894	17.1.39.	Ust-Ussa, Petchora River Russia, 21.8.40. [60° 0' N, 58° 0' E.]
3685	10.12.38.	River Oskui, Leningrad Province, Russia, 20.4.40.

No. Ringed. Recovered.

Tufted Duck (*Aythya fuligula*).

RINGS OF THE ORIELTON DECOY, PEMBROKE.

3879	12.1.39.	Loch Lomond, Scotland, 23.2.40.
3847	7.1.39.	River Mezen, Archangel Province, Russia, 26.5.40.
3873	12.1.39.	Ditto 30.5.40.
3923	20.1.39.	Ochten (Gelderland) Holland, 22.12.39.

Cormorant (*Phalacrocorax c. carbo*).

RINGED AS NESTLINGS.

113308	Mochrum (Wigtown), 1934, by Lord Dumfries.	Where ringed 19.5.41.
106312	Anglesey, 22.6.30, for Col. Pollitt.	St. Anne's (Lancs), 8.7.41.
123339	Skomer (Pemb), 2.7.38, by W. A. Cadman.	Vivero (Galicia) Spain, 20.10.40.
126396	Lambay (Dublin), 13.6.39, by Skokholm Bird Obs.	Garelochhead (Dumbarton), —.2.41.
126428	Ditto 14.6.39.	Newry (Down), —.3.41.
126277	Ditto 14.6.39.	Dundalk (Louth), 2.4.41.
126320	Ditto 14.6.39.	Dublin, 16.7.41.
126453	Ditto 14.6.39.	Mohill (Leitrim), 5.2.41.
126271	Ditto 14.6.39.	Wexford, —.1.41.

Shag (*Phalacrocorax a. aristotelis*).

RINGED AS NESTLINGS.

125325	Big Scar (Wigtown), 5.7.39, by Lord D. Stuart.	Tarbert (Argyll), 8.2.41.
123030	Douglas, Isle of Man, 20.6.40, by Manx F. C.	Dundrennan (Kirkcudbr.), 21.11.40.
121992	Calf of Man, 21.5.38, by Manx F. C.	Where ringed (breeding), 18.5.41.
125468	Benbane Hd. (Antrim), 3.7.40, by M. & D. Rankin.	Belfast (Antrim), —.1.41.

Gannet (*Sula bassana*).

RINGED AS NESTLINGS.

126721	Bass Rock, 1.7.39, by Midlothian O. C.	Happisburgh (Norfolk), 3.6.41.
124286	Grassholm (Pem.) 31.8.38, by Skokholm Bird Obs.	Reculver (Kent), 27.4.41.

RINGED AS FULL-GROWN.

AV.174	Grassholm (Pem), 9.6.39, by Skokholm Bird Obs.	Portland (Dorset), 28.1.41.
502258	Ditto 15.8.39	Looe (Cornwall), 17.12.40.
502044	Ditto 15.8.39	Carne (Wexford), 2.4.41.
502056	Ditto 15.8.39	Kinsale (Cork), 2.2.41.

No. Ringed. Recovered.

Manx Shearwater (*Puffinus p. puffinus*).

AT.876 Skokholm Bird Obs. Westward Ho (Devon),
15.6.39, ad. 6.8.41.

Ringed Plover (*Charadrius h. hiaticula*).

WA.890 Isle of Man, 29.6.41, young, Dundrum (Down), 20.8.41.
by Cowin & Ladds.

Lapwing (*Vanellus vanellus*).

RINGED AS YOUNG.

222837 Glenorchard (Stirling), Kilfinane (Limerick), 28.12.40
11.6.39 by J. Bartholomew.
206499 Raughton Head (Cumb), Esposende (Minho) Portugal,
5.7.36, by R. H. Brown. 6.2.41.
224049 Calthwaite (Cumb), 31.5.39, Oporto, Portugal, 13.2.41.
by Moon & Cooper.
217609 Shap (Westmor), 4.5.39, Crossend (Lancs), 1.3.41.
by Moon & Cooper.
226578 Kendal (Westmor), 29.6.39, Waterford, 10.1.41.
G. Moon & Cooper.
AN.6160 Clitheroe (Lancs), 18.5.32, Oulart (Wexford), 13.1.41.
by Oakes & Battersby.
220529 Ribbleshead (Yorks), Stradbally (Queen's Co.),
11.5.39, by Moon & 21.1.41.
Cooper.
218496 Bashall Eaves (Yorks), Pilling (Lancs), 5.1.41.
21.5.39, by Oakes & Battersby.
227752 Ballymore (Donegal), Newmarket-on-Fergus (Clare),
22.6.40, by J. 16.1.41.
Cunningham.

Curlew (*Numenius a. arquata*).

RINGED AS YOUNG.

RS.1894 Almondbank (Perth), Ballymote (Sligo), —.3.41.
9.6.32, by Lord Mansfield.
AB.8817 Dacre (Cumb), 5.6.39, Kilkeel (Down), 20.1.41.
by Moon & Cooper.

Woodcock (*Scolopax r. rusticola*).

RINGED AS YOUNG.

AS.1005 Islay (Argyll), —.6.36, by Brora (Suth), 13.1.41.
J. MacKillop.

RINGS ISSUED FOR WOODCOCK INQUIRY, 1934-35.

201003 Earlstoun (Kirkcudbright), Taldom, Moscow Province
1937. Russia, 1.5.40.
200333 Silverdale (Lancs), 1.6.36. Where ringed, 13.4.41.
Private Cong (Mayo), 1936. Knutby (Uppland), Sweden,
Ring. —.5.40.

No. Ringed. Recovered.

Sandwich Tern (*Sterna s. sandvicensis*).

RINGED AS YOUNG.

- 228568 Leuchars (Fife), 25.6.39, Freetown, Sierra Leone,
by W. J. Eggeling. 19.1.41.
229003 Ditto 3.7.39. Umtwalumi, Natal, 5.1.41.
231307 Farne Islands (Northumb), Olhão (Algarve), Portugal,
24.6.40, by Mrs. Hodgkin. 3.10.40.

Black-headed Gull (*Larus r. ridibundus*).

RINGED AS FULL-GROWN.

- 302690 Loch Moon (Kirkcudbright), 19.6.38, by W. Pollok-Morris. Lamlash, I. of Arran, 6.8.41.
309909 R. Thames, London, 8.11.39, by Lond. N.H.S. Kalmar, Sweden, 9.5.41.
313965 Ditto 13.1.40. Enköping (Uppland) Sweden, 1.5.41.
RV.7891 Littleton (Middx.), 8.2.35, Holt (Norfolk), —.4.41.
by P. Hollom.
RW.8251 Ditto 13.2.36. Where ringed, 23.3.41.
RV.8288 Ditto 25.11.35. Paldiski, Estonia, 2.9.40.

Common Gull (*Larus c. canus*).

- RX.6694 Littleton (Middx.), 13.2.37, Malden (Surrey), 10.2.41.
by P. Hollom.

Herring-Gull (*Larus a. argentatus*).

RINGED AS YOUNG.

- AC.7820 Douglas, Isle of Man, New Mills (Derby), 12.1.41.
15.6.39, by Manx F. C.
AC.9398 Dungeness (Kent), 5.7.39, Longstock (Hants), —.4.41.
by Brooker & Cawkell.
AC.4578 Strangford Lough (Down), Abbotsbury (Dorset), —.2.41.
30.6.38, by J. Cunningham

Lesser Black-backed Gull (*Larus f. graellsii*).

- AB.5454 Walney I. (Lancs), 16.6.36, St. Anne's (Lancs), 17.4.41.
by H. W. Robinson.

Great Black-backed Gull (*Larus marinus*).

- 401466 Littleton (Middx.), 4.2.35, Gravesend (Kent), —.11.40.
by P. Hollom.

Southern Guillemot (*Uria a. albionis*).

- AC.5309 Skokholm Bird Obs. Ramsey Island (Pem)
12.7.38, ad. —.4.41.

Puffin (*Fratercula a. grabæ*).

- 315092 Skomer (Pem), 11.7.39, Hayle Estuary (Cornwall),
ad., by W. A. Cadman. 5.6.41.

OBITUARY.

HENRY MARRIAGE WALLIS.

(1854-1941).

H. M. Wallis was born at Ipswich in January, 1854, and was therefore nearly 88 when he died on November 10th, 1941.

His father was a keen naturalist, but his own interest in natural history, and particularly in birds, developed while he was at Bootham School, York. As he was in business as a corn and seed merchant in Reading until 1909 it was chiefly during holidays that he could indulge in his hobby.

As a young man he visited Sutherland several times with his brother-in-law, J. B. Crosfield. Both had egg collections and they had some hazardous and exciting adventures climbing to nests of Ravens and Golden Eagles. Occasionally they saw White-tailed Eagles, but never found a nest of this species. In 1875 they found Goosanders breeding on Loch Shin, the first definite record for the county and only the fourth for Scotland.

In the summer of 1882 H. M. Wallis found on Loch Urigill the nest of a duck which he failed to identify. The eggs and down were submitted to J. A. Harvie-Brown who declared they were those of the Pintail, at that date not known to breed on the Scottish mainland. Later Harvie-Brown became less positive and wished to re-examine the down, but it had unfortunately been destroyed by moth so this was not possible.

In the summer of 1886, in company with his life-long friend G. H. Fox, of Falmouth, H. M. Wallis visited western Donegal and discovered a pair of Tree-Sparrows on the island of Aranmore. At that time they had never been met with in Ireland except in Co. Dublin and his statement was treated by Irish naturalists with considerable scepticism. It was not till some twenty years later that the species was again met with in western Ireland, first in Co. Mayo and then in various localities in Donegal. It was a great satisfaction to him to learn that in 1939 a pair had been found on the very farm on Aranmore where he had seen them 53 years before (see *British Birds*, Vol. xxxiv, p. 107). On this same expedition H. M. Wallis found a pair of Red-throated Divers nesting on the mainland. It had been reported previously that some species of diver nested in Donegal. Howard Saunders had surmised it was the Red-throated and his surmise was thus proved correct.

In the summer of 1890 Wallis and Fox visited Norway and found Shore-Larks on the Dovrefjeld considerably farther

south than they had previously been known to occur in summer.

In 1894 the two friends, with their wives, made a holiday trip in the Central Pyrenees. They saw a Fieldfare and found a nest which was unfortunately empty, but which was just like those with which they had become familiar in Norway. On visiting the place again a week later they found the lining of the nest had been pulled out, apparently by Jays, so the breeding of the Fieldfare in the Pyrenees was not definitely proved. In this region H. M. Wallis first met with numerous large Raptores, the group of birds in which he was always specially interested and whose habits he subsequently studied during visits to Morocco and Algeria, as well as in the Alps and the Balkans. His diagrammatic sketches of vultures, eagles, buzzards and harriers on the wing, showing their distinguishing features in flight, will be familiar to those who have used the *Practical Handbook* and some of them are reproduced in the new *Handbook*.

Although he never attempted a systematic ornithological work, H. M. Wallis published a number of notes and short papers, which gave evidence of the keenness of his powers of observation. From 1917 to 1936 he was a frequent contributor to this journal. Perhaps his most noteworthy papers were on the "Mortality among Birds during the February frost in West Cornwall" (Vol. x, p. 267) and on "Recent Changes in the Birds of Scilly" (Vol. xvii, p. 55).

He was elected to the B.O.U. in 1895 and for many years he regularly attended meetings of the B.O.C. Although latterly he rarely intervened in discussion, when he did so the vigour and liveliness of his mind were manifest.

During the middle of his life, under the nom-de-plume of Ashton Hilliers, he wrote several novels, all of them vigorous, lively tales, showing a mind that was well stored with historical incident and all manner of curious information. In most of these books one or more of the characters were bird-lovers or egg-collectors and many of his own experiences or observations were attributed to them.

He was also a great raconteur and to the end, even when he was bedridden, he would regale visitors with lively stories of his adventures among birds and in other fields too: certainly his tales lost nothing in the telling.

W. B. A. AND H. G. A.

NOTES

WAXWINGS IN GREAT BRITAIN.

INVERNESS-SHIRE.—Mr. D. Nethersole-Thompson and Mr. W. Marshall inform us that a party of ten Waxwings near Nethy Bridge was reported on November 21st.

Miss E. V. Baxter and Miss L. J. Rintoul write that they heard of two near Mallaig on November 12th, which is interesting in view of those reported from Skye (*antea*, p. 157).

FIFESHIRE.—The Misses Baxter and Rintoul report one seen near Dumferline about November 9th.

NORTHUMBERLAND AND DURHAM.—Mr. G. W. Temperley reports considerable numbers of Waxwings in these counties. The earliest notified were thirteen on November 9th (reaching twenty-one on the 18th) in the Derwent valley (Durham). On the 11th a large flock established itself in the middle of the city of Newcastle in Eldon Square. This flock reached a maximum of forty-four, while varying numbers have been seen in the city parks and gardens and two or three visited the grounds of the Hancock Museum. Mr. Temperley adds "On three sides of Eldon Square are large houses, now all used as offices, on the fourth side is a main thoroughfare with trams, buses, &c. The square is used as a car-park and round its outer edge is a fringe of white beam trees laden with berries. The birds feed, un-noticed, above the heads of the passers-by and fly up to roost on the house tops." They were last seen here on November 28th. Seven were reported near Hartlepool (Durham) in the first week of December.

Mr. R. Perry informs us that he saw one at Holy Island on December 1st.

YORKSHIRE.—Twenty were present in the park at Middlesbrough in the first week of December. (G. W. Temperley).

NORFOLK.—Mr. Jim Vincent writes that he saw four Waxwings feeding on wild briar berries on a marsh at Hickling on November 29th and was told of six others, also feeding on rose-hips, about two miles away.

SIBERIAN CHIFFCHAFF IN NORTHUMBERLAND.

ON November 19th, 1941 at about 2 p.m., while walking by the ponds at Newton Hall, Stocksfield, Northumberland, I saw a leaf warbler, which I feel sure was a Siberian Chiffchaff (*Phylloscopus c. tristis*). When I first saw it, it was on a willow by a small pond, and it went down to the water's edge several times, touching the water each time, and eventually bathed

thoroughly. It was very tame, and I had a good view of it at a range of only a few feet. The eye-stripe was of a warm creamish colour. The upper-parts were brown with only the slightest touch of greenish about the sides of the back. The under-parts were whitish, very white towards the tail, without a vestige of yellow. The legs were dark, and during one view I had, appeared to be almost bright black.

After the bird left the water I had it under observation for a further half-hour or so, during which time it was continuously on the move from tree to tree, but favouring trees on which there were still some leaves, and never far from the ponds.

The weather was brilliant after much fog in the morning, which did not clear up until after midday, a factor which may possibly account for the bird's appearance here.

I see from the *Handbook* that the Siberian Chiffchaff frequents the neighbourhood of water, and the fact that my bird was so interested in, and at home about the water, is probably additional evidence that it was of this sub-species. I have certainly never seen any other leaf warbler behaving as this one did at the water. The late date of its appearance also points to its being of this form

H. TULLY.

YELLOW-BROWED WARBLER IN DEVONSHIRE.

On opening my front door during the afternoon of November 19th, 1941, a small warbler was observed to be searching a rose-bush a few yards away, in my garden at Sidmouth, Devon. A long, very distinct yellowish-white superciliary stripe, two whitish wing-bars separated by a brownish-black band on each wing, green upper-parts greenest on rump, and whitish under-parts showed it to be a Yellow-browed Warbler (*Phylloscopus i. inornatus*).

The bird was not alarmed at my presence, but flew to a bush of *Ceratostigma* only 6 ft. from me and 3 ft in height, investigated several twigs, and then moved to a boundary hedge of the garden where I lost sight of it.

Immediate reference to *The Handbook of British Birds* confirmed the identification. The bill of this bird appeared to be slightly curved, probably the culmen only, and not as straight as in the figure of the male on Plate 34, which otherwise it closely resembled.

W. L. COLYER.

MODE OF FEEDING OF TURNSTONE.

REGARDING the Turnstone (*Arenaria i. interpres*) reported as seen at Tring (*antea p.* 112) a note on its feeding habits might be of interest, especially as there has been a certain amount

of discussion on this subject. On the day of arrival it found its food in a normal manner, but on following days (it stayed at least five days) it fed almost entirely by probing, using two distinct methods, oblique and vertical probing. In the first, the bird slightly crouched and pushed the bill forward and downward into the mud, withdrawing it along the line of probe. Occasionally it used a variation of this—instead of withdrawing the bill it raised it in a spade-like manner, pushing the mud up in a ridge on both sides. This last is the method described by Mr Bayne (*antea*, Vol. xxxiv, p. 111). In the second it pushed the bill in in one direct probe, sometimes with one or two up and down motions in case of an exceptionally deep probe. In all methods the whole bill was usually covered. At times it probed under water and on at least two occasions the whole head was immersed.

It seems peculiar that such an excellent observer as the late Dr. Dewar should say that he had only known a Turnstone to probe on one occasion (*antea*, Vol. xxxiv, p. 28) whereas this bird, for four days on end, used this method almost exclusively.

J. N. HOBBS.

UNUSUAL NUMBER OF GLAUCOUS-GULLS IN ABERDEENSHIRE AND NORTHUMBERLAND.

On October 29th, 1941, I was at the mouth of the Don Estuary and came upon a party of gulls. The nearest one first caught my eye because of its great size—it was standing close to a Great Black-backed, and a second look showed its pure white wing-tips. It was a Glaucous Gull (*Larus hyperboreus*) in nearly adult plumage with a few brown flecks on the head and neck. I then looked at the other gulls a little farther on and to my surprise they were exactly the same and when they rose the pure white wings of all five were unmistakable; at this moment they were joined by a sixth in pale coffee-coloured immature plumage. These six flew up the estuary. About fifty yards farther on I came in sight of the main body of the gulls to sea-ward. I was first struck by the impressive phalanx of the Greater Black-backed Gulls, but as I looked at them more closely their companions seemed to be mostly adult Glaucous—some of the nearer undoubtedly were—and as some of these rose the black-tipped wings of a couple of Herring-Gulls among them were very noticeable. They appeared to be adults and I saw for certain only one other immature Glaucous among them. Then there were a few more Glaucous adults among birds scattered about along the shore to the right.

Unfortunately I was too far away to be certain of more than the nearer fringe of birds, as under present circumstances it is not possible to use field-glasses, but there were certainly over twenty Glaucous Gulls around this small area, and the number may well have been many more.

As I see from the *Handbook* that the date is unusual I may add that Mr. Kenneth Wood and I saw an immature Glaucous Gull near Aberdeen on May 11th, 1940. A. M. GWYNN.

[Mr. R. Perry informs us that at Holy Island, Northumberland during westerly gales from October 27th to 29th he saw an unusual number of Glaucous Gulls -- a dozen adult and immature--and in calm six on the 30th and one on the 31st. Previously he had seen three on the 23rd, during a great northerly movement of sea-birds, while some (one to five) were present to the middle of December, several of these being adults. EDS.]

FIRECREST IN MIDDLESEX.—Mr. C. A. White sends us details of a Firecrest (*Regulus i. ignicapillus*) of which he had satisfactory views on Ruislip Common on November 29th, 1941. A second bird could not be satisfactorily identified at the time, but on December 13th both were seen clearly to be Firecrests. The species was noted at Ruislip in December, 1938 and at Stanmore in April, 1941 (*antea*, p. 18).

REDSTART BREEDING IN GLAMORGAN AND S. MONMOUTH :—With reference to the note on this subject (*antea*, p. 133) Mr. Bruce Campbell informs us that he flushed a Redstart on June 9th, 1941, from a nest with six eggs in Garth Wood not far from Pentyrch (wrongly printed Pentytch in the note on p. 133). He also saw a pair on May 1st and heard the cock singing consistently until the end of June, at Thornhill a few miles farther east.

As in the recently published *Birds of Monmouthshire* by G. C. S. Ingram and H. M. Salmon the Redstart is stated to be very local and scarce in the south of that county, it should be added that Mr. Campbell found a nest with eggs on May 18th near Caerleon.

GREAT SNIPE IN HERTFORDSHIRE.—Mr. W. E. Glegg informs us that on Nov. 5th, 1941 he saw a Great Snipe (*Capella media*) at the Wilstone Reservoir, Tring. The bird, which attracted attention by its size, was examined on the ground with a telescope, and the stouter bill as compared with Common Snipe was noted. It was not at all shy and when flushed only flew a short distance with characteristic slow, heavy action.

LETTER.

THE WOOD-PIGEON INVESTIGATION.

To the Editors of BRITISH BIRDS.

SIRS,—At the present time few naturalists have leisure to solve biological problems of academic interest only. The Wood-Pigeon forms no such problem. It takes a steady toll of arable farms, afforestation, market gardens, private gardens, and even fruit farms. It has increased beyond the capacity of this island to support it without a serious loss in efficiency, and it is now acknowledged as a major pest.

The British Trust for Ornithology has received a grant from the Ministry of Agriculture, enabling it to continue its study of the biology of the Wood-Pigeon and possible methods of control. The writer is also engaged on experimental control measures, but as this is necessarily individual research it is not included within the scope of this appeal. By "control" is meant the limitation of the population to reasonable proportions, a policing usually undertaken by natural predators. Control measures can only be applied scientifically if our knowledge of the life history of the species is fairly complete, which is certainly not the case for the Wood-Pigeon. To complete this knowledge many field observations are necessary, and because two pairs of eyes see more than one, and because also our national food supplies are involved, observers everywhere are asked to co-operate and give all the help they can. It is hoped that many will interpret this to include looking through and summarising their past notes. The investigation itself covers the following points: increasing our knowledge of relative distribution by counts of Wood-Pigeons seen; a study of flocking and feeding grounds; of flock behaviour and formation; of roosts; the crop contents of shot Pigeons; their weights and measurements; the dispatch of diseased birds to this centre; breeding censuses; main breeding season; predators; breeding mortality; breeding habitat and position of nests; the share of sexes in incubation and care of young; evidence of colonial breeding. Full particulars of the winter programme may be obtained from this Institute. I hope that everyone who reads this will make an effort to combine his own recreation with contributions towards one or two of the above subjects. It is a naturalist's opportunity, and it will surely never occur again, so urgently.

All correspondence should be addressed to me, personally, at this Institute. On receipt of a post card further details will be sent.

M. K. COLQUHOUN.

EDWARD GREY INSTITUTE, 39 MUSEUM ROAD, OXFORD.

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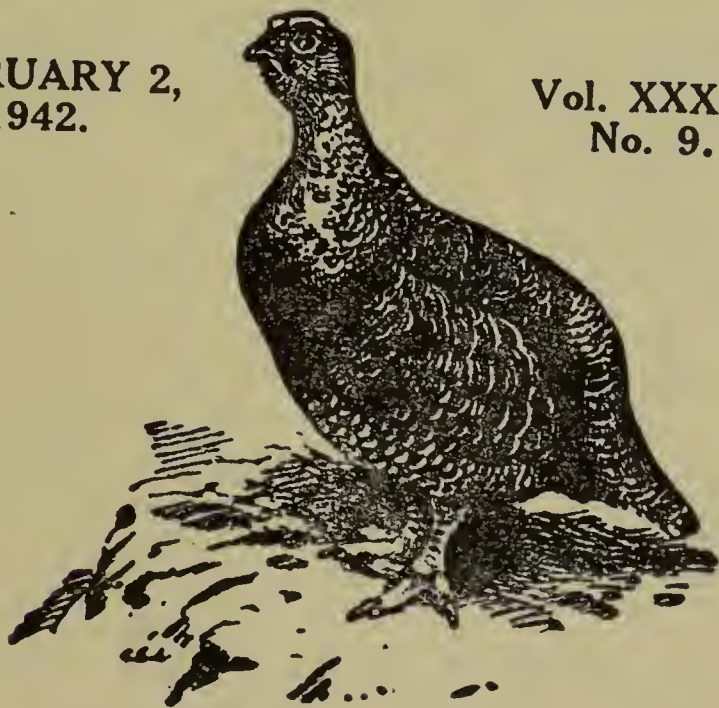
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FIELD OBSERVATIONS ON THE BREEDING BIOLOGY OF THE YELLOW WAGTAIL

BY

STUART SMITH, PH.D.

THESE observations on the Yellow Wagtail (*Motacilla flava flavissima*) are based on close study of this species during the last three years. The area containing the birds is a small market garden farm, surrounded by rough pastures. It is bounded on the north by the River Mersey, which here forms the border between Lancashire and Cheshire. Of late years the species has greatly increased, and in 1941 the Yellow Wagtail distribution here averaged one pair to three acres over about twenty acres.

MIGRATION.

In spring, the cocks arrive first and precede the hens by at least a week, and often by a fortnight. Arrival in this district is usually during the third week of April. (Dates for first cocks: 1939, April 18th; 1940, April 13th; 1941, April 17th). The autumn departure is invariably complete, as far as the local birds are concerned, by the third week of September (last dates for local parties: 1939, Sept. 15th; 1940, Sept. 18th; 1941, Sept. 15th). During August, the birds show a distinct tendency to pack together, and will often commence communal roosting in withy beds and reeds. Before departure, the family parties, which keep together during the summer, have the habit of flying round in circles at evening, calling excitedly. They appear to be night migrants, and may often be seen and heard passing overhead at dusk.

TERRITORY AND DISPLAY.

The cocks do not begin to adopt a territory until the arrival of the hens, and during the first days will consort together at the river's side. As soon as pairing has taken place during the first two weeks of May, however, they become very aggressive, and rival cocks fight more fiercely and seriously than the majority of small passerine birds. Aggressive display takes the form of puffing out the breast to display the yellow under-parts, the bird meanwhile sitting back on its tail with head held erect and body stiff; very similar in appearance to a miniature pouter pigeon. Fighting takes place both on the ground and in the air; one cock which had succeeded in getting a rival prostrate on the ground used its hind claw to tear at the breast feathers. Sometimes the hens stand around

watching, in a tense crouching attitude. The highly aggressive attitude to other birds of the same species is continued until the young have left the nest, and in several instances where the feeding area of one pair tends to over-lap the breeding territory of another, fighting between the pairs is frequent. In such cases, the females join in. An interesting case in point is given by the pair of nest No. 8, which came into the local territories from some fields across the river. They arrived on June 10th and attempted to settle down on a plot of ground next to nest No. 7, which pair then had young five days' old. They were so harried by pair No. 7, however, that it was not until June 18th, two days after the young had left that nest, that the female was able to lay her first egg in a nest about fifty yards from No. 7.

The cock birds sing in their territories, using a prominent clod of earth or a stick. There is also a song-flight, undulating and erratic, over the territory. The song is a high-pitched warbling repetition of the tri-syllabic phrase "tsee-wee-sirr," with the usual "tsweep" call-note interspersed. When delivered from the ground, it is uttered with head held back and bill pointing somewhat upwards. Nuptial display takes the form of fluttering over the female with fanned tail, and of strutting before her with pouted breast and dragging or fluttering wings, the head thrown well back.

BREEDING AND FOOD.

Three main types of nest site are used locally, viz., beneath a clod on fallow land; amongst standing arable crops or young vegetables; and rough tussocky herbage in meadows. The nest is built by the hen alone, the materials often being collected from a considerable distance, *e.g.* half a mile. The main basis is roots and dry bents well lined with horse hair. For incubation and fledging periods, tabulated data are given below.

Nest.	Site.	Clutch Completed.	Eggs.	Hatched.	Young.	Period Days.	Fledged.	Period Days.
1	Tussock,							
	Marshy pasture ...	May 16	6	May 29	5	13	June 8	10
2	Grass tuft,							
	Dry pasture ...	May 22	5	June 3	5	12	June 13	10
3	Grass tuft,							
	Rly. embank't. ...	May 17	5	May 29	5	12	June 8	10
4	Standing corn							
	(Oats) ...	May 18	6	May 31	5	13	June 12	12
5	Tussock,							
	Marshy pasture ...	May 20	6	June 1	6	12	June 12	11
6	Beneath clod,							
	Fallow plough ...	May 21	3	June 3	2	13	June 14	11
7	Weed tuft,							
	Vegetable plot ...	May 23	6	June 5	5	12	June 16	11
8	Potato plant,							
	Vegetable plot ...	June 22	5	July 4	5	12	July 14	10

The eggs are laid on successive days, and incubation starts with the last egg. No evidence of a double brood has been obtained, the late nest No. 8 being that of a pair which transferred from another area after the local birds had hatched off. As previously recorded [I], both male and female incubate the eggs and brood the young. Regular changes occur during incubation in the manner there described, and the nests are best found by waiting in a known territory for the change-over, when the returning bird always calls the sitting mate from the nest. For a few hours after hatching of the



COCK YELLOW WAGTAIL of nest No. 6 awaiting defecation of young.
(*Photographed by Stuart Smith.*)

young, the down has a pale rosy hue, but this changes to a light buff colour after the first day. Both sexes feed the young from the bill. Food observed as brought to the young was mainly small dipterous flies, black and green aphids, crane flies, and small beetles. The flies are caught by darting upon them on the ground, or by picking them from leaves and vegetation.

In nest-sanitation, undertaken by both adults, the birds stand at the side of the nest, stimulating the young occasionally, though not regularly, by prodding and down-tugging. Up to five or six days, the faecal sac is taken from the cloaca as it

emerges and carried away when the adults walk away from the nest, to be dropped at a distance. Swallowing by the female was twice observed during this period. After seven days, the young commence deposition on the rim of the nest, usually at one side only. The photograph shows the cock bird of nest No. 6, who was induced to clear an area round the nest of all white objects, in the manner previously described in this journal [2]. It displays the rapt attention usual in birds when awaiting defecation by the young. In a similar manner, the hen bird of nest No. 8 removed many small pieces of white dead grass from the side of the nest.

PLUMAGE VARIATION.

Wide variations in plumage occur in both male and female birds, a point stressed by Coward [3]. There is here no possibility of inter-breeding with the Blue-headed Wagtail (*M. f. flava*), which is locally of very rare occurrence, there being only one record, a cock on migration, in five years. The female of nest No. 1 was indistinguishable from a Blue-headed Wagtail, having the typical white eye-streak and chin, and greyish crown. Other females show gradations between this and the typical yellow. The male bird of nest No. 7 resembled an immature bird, having little or no yellow on the breast and a distinct black mark running from the lores, under the ear coverts, to the throat. Many of the cocks when they arrive in April are brilliantly coloured, but rapidly deteriorate, so that the plumage is considerably dulled and varied before breeding has finished. Such variations can have no bearing, however, on the abnormal pair recently recorded as breeding in Norfolk by Rivière [4], all local variations being readily traceable to failure to assume completely the adult breeding phase, or to reversion tendencies towards the basic form *M. f. flava*.

REFERENCES.

- [1] *British Birds*, vol. xxxiii, p. 312.
- [2] *British Birds*, vol. xxxv, p. 120.
- [3] *Birds of the British Isles*, Vol. i, pp. 109-110.
- [4] *British Birds*, vol. xxxv, p. 127.

EGG-SHELL DISPOSAL BY BIRDS

BY

CAROLINE AND DESMOND NETHERSOLE-THOMPSON.

(continued from page 169)

In the systematic lists we have also cited data, whenever such is known to us, of reactions towards damaged or addled eggs, because these are fundamentally connected with this same problem. Most birds, however, appear to ignore addled eggs once the incubation-drive has abated, but some of the Limicolæ certainly discriminate between an addled and a "chipping" egg, no doubt by means of the "cheeping" cries of the unhatched chick—some parent birds also have cries exclusively used during the hatch, but it must be remembered that positive data on this subject are always less easy of discovery. It is worth recording, therefore, that we have definite proof that a particular hen Starling ejected a couple of addled eggs and it is almost certain that a Golden Eagle also treated an infertile egg in the same way, although this is certainly not the usual custom of either species. Another interesting record is that of L. H. Dagley, who watched a Continental Blue Tit remove an addled egg in its bill.

Damaged eggs, on the contrary, with many species, not infrequently cause nest-desertion—this is particularly noticeable if an egg happens to be broken during the laying phase or early in incubation—but we have found that if the initial danger period is safely weathered the broken egg may be ignored, and is then neither ejected nor removed during the hatch. We have proved, however, that Red Grouse sometimes remove damaged eggs, Oyster-catchers also may either eat or remove them, and we hold a record of a Grasshopper-Warbler probably having done the same with a couple of broken eggs.

Mr. F. B. Kirkman has likewise found that some Black-headed Gulls suck or eat their own eggs should these contain a gash or hole of a certain size. Another most interesting observation on this topic was that of D. B. Keith (*antea*, Vol. xxxi, p. 74) who, from a hide, watched the reactions of a pair of Red-throated Divers towards an egg, which had been broken. "The female almost at once came back and picked up in her beak the broken egg which was lying outside the nest and carried it about twenty yards out into the tarn. Here she was joined by the male, and both broke up the egg into small pieces with their beaks—biting and shaking it about." We shall also always remember how graphically our friend, the late Percy Meeson, used to describe how he had watched

a female Peregrine devour one of her eggs which had been damaged by a falling rock.

Before we proceed to the systematic list it may be of interest to sketch some of the shell-disposal characteristics of the various families and orders. In the *Corvidæ* there is apparently considerable diversity in method—eating of egg-shells by several species has been proved—but most of the small passerines remove their egg-shells to a distance, although some of the hard-billed finches on occasions certainly break up and eat them. The hole-nesting tits generally remove egg-shells (D. W. Musselwhite), and the same applies to the Bearded Tit (J. Vincent), but the hen Scottish Crested Tit, while flying away with large fragments, allows smaller pieces to be trampled into the nest-lining.

Mr. J. H. Owen, in the course of his painstaking and detailed observations on the breeding-biology of the Red-backed Shrike, has proved that the hen normally drops the shells in flight, but that if hatching is prolonged, as it often is, the cock also removes them, though his technique is rather different and one even pinned a large shell-fragment in the “larder” on a blackthorn!

Shell-carrying, to the best of our knowledge, appears fairly general among *Sylviidæ* and *Turdidæ*—Mistle- and Song-Thrushes admittedly sometimes eat their egg-shells—and, although the reaction varies, carrying is the usual method of the Swallows. The European Nightjar, normally careless in its disposal arrangements, sometimes also carries away its shells (J. H. Owen and D. N-T.). The Kingfisher, on the contrary, whose sanitation methods are notoriously defective, may elaborately remove its egg-shells. R. L. Brown (*antea*, Vol. xxvii, p. 257.) watched a male remove at least one shell in his beak and another in his claws on the same journey.

Insufficient data prevents generalisation, but active disposal by all species of British-breeding Woodpeckers has been recorded, although removal does not necessarily occur until the hatch is complete. O. Steinfatt also watched a male of the northern form of Great-spotted Woodpecker remove a dead chick to a distance of over 40 yards. There is likewise comparatively little reliable information about the disposal habit among owls, but although there is evidently variation, all of the British species are known to have removed large portions. Trampling down of shells has also been noted. It may be relevant to mention, therefore, that the Californian Pygmy Owl (*Glaucidium g. californicum*) “removes all egg-shells and undesired débris from the nest” (M. P. Skinner in A. C. Bent’s *Life Histories of N. American Birds of Prey*, ii,

p. 414) and this tends to confirm observations made upon some of our British owls.

In the Accipitres several, but not all, of the species are known to break up and eat their egg-shells, but the same method is not necessarily employed on every occasion (*e.g.* Montagu's Harrier and Sparrow-Hawk), and indeed it can be confidently anticipated that further research will reveal an even greater variety of usages among the birds of this order than is at present known to us.

Among *Ardeidæ*, Common Herons normally drop their shells over the nest, whereas the hen Bittern, stretching forward from it, pushes the two halves one by one under water (Miss F. Pitt and Lord William Percy) or carries them a few yards and then drops them (J. Vincent.)

Anseres show little or no inclination towards active disposal, but there is a record of shells having been found outside a Sheld-Duck's burrow (T. Southwell, *antea*, Vol. ii, p. 61.). Cormorants carelessly eject their shells; with some Petrels non-removal is normal, ejection exceptional, but the egg-shell of the Manx Shearwater may possibly be eaten as it vanishes almost as soon as the chick is dry (R. M. Lockley). Among British breeding grebes disposal of large portions is normal, but not inevitable. Divers, however, permit much to remain in the primitive nest, non-removal having also been recorded in the Great Northern Diver by D. Lack (*MS.*) and E. B. Dunlop (*antea*, Vol. ix, p. 144). Pigeons' methods vary, Wood-Pigeon and Turtle-Dove frequently dropping shells over their nests, but at other times flying with them to a distance and then dropping them.

With the Limicolæ on the contrary, all stages of development have been noted and practically every known practice observed. Snipe, for example, are particularly lax in their disposal reactions. Common Snipe rarely remove any of the shells, and the same rule also apparently applies to the Great Snipe (*e.g.* R. Collett, *Birds of Northern Norway*, p. 73 and T. Jenssen, *Danske Fugle*, 1929, p. 2) and to the American Snipe (*e.g.* H. Mousley, *Auk*, 1935, p. 410, etc.) Yet, there are other waders, which not only dispose of all the large shell-portions, but the small pieces as well.

A particularly interesting trait of Lapwings is that of burying small shell-fragments under the nest-lining. This is apparently deliberate concealment, but final judgment must be suspended until fuller knowledge is attained.

In E. B. Dunlop's journal it is recorded that a certain Common Curlew in 1912 placed one of her four egg-shells on the edge of the nest—there were two chicks in the nest and a

couple a few yards away when it was examined—but the following evening when the chicks had departed this fourth egg-shell had also been replaced. How greatly enhanced is the significance of this interesting note when, in 1938, we read that O. Steinfatt, while watching a Woodcock's nest, observed that when the newly-hatched chicks did not follow her, the hen lifted the shells from the cup on to the edge of the nest and brooded the young, *but when these finally left she replaced the shells.* (*Journ. f. Ornith.*, 1938, p. 415.)



COCK DOTTEREL broods two eggs and one chick. Egg-shell rolled out of nest and not carried away until an hour and twenty minutes later. (*vide antea* p. 166).

(*Photographed by John Markham*).

We also commend to the attention of readers the remarkable observations in the shell-disposal behaviour of Avocets (G. F. Makkink, *Ardea*, 1936, p. 53). These birds, in common with certain other waders, not only share a tendency to drop hatched shells in water, but, while sitting, should one notice a discarded egg-shell in the colony, or even at a distance, it may approach and remove it.

That, then, is a cross-section of the disposal peculiarities of a fascinating group, and the closely-allied Stone-Curlew, makes

an equally noteworthy contribution to the varied story, as E. Hosking has actually watched a cock wrench off the tops of both eggs, help the chicks to free themselves, then carry away, stamp upon, crush, and eat some of the main portions.

In Lari, it is already evident that a considerable number of gulls and terns, as our own observations and those of others prove, regularly remove and fly away with large portions of shell, although this tendency is more marked among some species than others, and with the gulls the distance to which the shells are removed is in many cases short (shell-eating has also been noted by R. M. Lockley). Among skuas, the Arctic is more active in disposal than is the Great Skua, but Mr. Ralph Chislett tells us that, at a nest of Long-tailed Skua, which he was studying, the egg-shell was removed very soon after hatching. The disposal practices of auks are not normally elaborate. Rails' reactions vary; there being proof of removal, consumption, and non-ejection, but removal appears to be more frequent when the eggs hatch singly rather than in batches. Moorhen and Coot are also often, but not invariably, slovenly in disposal.

Shell-disposal is absent or rudimentary among Galli, but nevertheless some interesting incidents have been recorded. It may also be worth mentioning that although domestic fowl and turkeys normally leave their shells in the nests, shell-eating by a brown leghorn was noted by one of us, and Mr. C. V. Stoney watched a guinea-hen stalk away with a discarded shell in its beak.

Methods adopted by birds not on the British List, lie outside the scope of this paper but, abroad as in Britain, variation is considerable. Mrs. M. Nice, for example, in her classic *Studies in the Life History of the Song Sparrow*, p. 130, mentions that shells were eaten by three females watched, but were carried away by a bird in Ithaca, New York (D. W. Haldeman, *Auk*, 1931, pp. 385-406). Young Flamingos also add to disposal technique by eating fragments of egg-shell (F. M. Chapman, *Camps and Cruises*, p. 189.)

It should be explained that to save space it was decided to restrict this paper to those species which breed or have bred in Britain and we have aimed at giving a brief account of the main disposal-practices rather than a long list of references and authorities.

In the appended systematic list all records are based upon our own field-observations unless there is specific mention to the contrary. It should also be added that our research on the Scottish birds in 1939-41 has been financed by grants from the Leverhulme Research Fellowships Committee and the Institute for the Study of Animal Behaviour.

RAVEN (*Corvus c. corax*).

Fragment of egg-shell found in under-cliff away from nest. Shells either eaten or carried away as hatched. In one case strong evidence that complete shell was eaten (D.N-T). Pieces of shell also trampled into lining (G. Arthur).

HOODED CROW (*Corvus c. cornix*).

Large fragments of shell found upwards of 300 yards from nest containing small young. These were definitely carried away by one or other of parents, but no evidence as to which was responsible or whether this method is normal. Shells are, however, eaten or removed as hatched and in nests examined little trace of shells to be seen.

CARRION-CROW (*Corvus c. corone*).

Shells either eaten or carried to distance as hatched (D.N-T.) No egg-shells in nests containing young (C. J. Bellamy). Sometimes just tipped out, but the general rule is to carry away if only for short distances. This applies to *Corvidæ* generally (J. H. Owen).

ROOK (*Corvus f. frugilegus*).

At two nests females seen to eat egg-shells (G. K. Yeates and H. N. Southern, *Brit. B.*, xxvi, p. 32). Female also seen to throw shell over side of nest when egg hatched (C. D. Deane, *Irish. Nat., Journ.*, March 1939, p. 136). Many egg-shells picked up under trees in rookeries by D.N-T., A. Whitaker and others.

JACKDAW (*Corvus monedula spermologus*).

Considerable portions of shell may be crushed into lining, but large fragments either eaten or removed. Egg-shells not found on ground below colony.

MAGPIE (*Pica p. pica*).

Discarded egg-shell found well away from nest and some small fragments noted in lining (D.N-T.). A tame bird broke up and ate two egg-shells placed in a nest containing small young (F. Pitt, *Country Life*, July 27th, 1940, p. 74). Shell found below nesting tree (D. Stubbart), but eating of shells probably more usual method as shells rarely found by comparison with nests examined.

BRITISH JAY (*Garrulus glandarius rufitergum*).

Shells broken up and eaten by female (J. Markham).

CHOUGH (*Pyrrhocorax p. pyrrhocorax*).

Shells certainly largely eaten or removed. Large portion of shell once found (F. McCurdy).

STARLING (*Sturnus v. vulgaris*).

Egg-shells removed by female in bill and usually dropped c. 20-50 yards from nest. In one case two addled eggs, and

on another occasion, a couple of dead chicks were definitely ejected and dropped close to nest-hole (C. and D.N-T.). This method of disposal also noted by R. Ware, W. Marshall and D. Stubbert, who noted that shells were dropped close to the nest, and by C. E. Baker, who noticed that one-half of shell was generally tucked inside other. Removal also witnessed by G. Marples, *cf.*, *Brit. B.*, xxx, p. 19.

HAWFINCH (*Coccothraustes c. coccothraustes*).

In one case female broke up and ate an egg-shell during hatch (D.N-T.). No trace of shells after hatching (in captivity). Shells, therefore, eaten (W. E. Teschemaker, *Avic. Mag.*, 1912, p. 33).

GREENFINCH (*Chloris c. chloris*).

In some cases female carries away shells. Addled eggs not ejected (D.N-T.). Female carried several shells short distance from nest and dropped them on a roadway (D. Stubbert).

GOLDFINCH (*Carduelis c. britannica*).

Shells eaten or removed. Addled egg not ejected (J. Markham). Shells absent from nests containing young (C. J. Bellamy).

SISKIN (*Carduelis spinus*).

Shells removed. Strong evidence that in many cases they are broken up and eaten, only very minute shell fragments noted in nests after hatching.

BRITISH TWITE (*Carduelis flavirostris pipilans*).

Egg-shells eaten or removed. Some small pieces in lining (D.N-T.). Fragments of shell trampled into lining (G. Arthur). Shells promptly eaten as each chick hatched (J. Armitage, *Brit. B.*, xxi, p. 119).

LESSER REDPOLL (*Carduelis flammea cabaret*).

Shells removed or eaten, but small pieces trampled into lining. Addled egg not ejected.

LINNET (*Carduelis c. cannabina*).

Shells removed. Large portion found well away from presumed nest. Addled egg not ejected.

BRITISH BULLFINCH (*Pyrrhula p. nesa*).

Shells eaten or removed. Addled egg not ejected (D.N-T.) Sitter seen to drop shells some yards from nest (J. H. Owen). Hatched shell picked up in grass away from nest (A. Whitaker).

COMMON CROSSBILL (*Loxia c. curvirostra*).

Shells eaten or removed as hatched. (*cf.*, Scottish Crossbill). Very few traces of shell in nests containing young.

SCOTTISH CROSSBILL (*Loxia curvirostra scotica*).

Shells eaten or removed as hatched. Have watched female carry away an egg-shell in bill, but in 1939-40 two definite

records of female breaking up and eating shell. Only the most minute shell-fragments in nests containing young. Eating probably normal method of disposal. Broken eggs may cause desertion.

BRITISH CHAFFINCH (*Fringilla cælebs gengleri*).

Shells either eaten or carried to distance as hatched. Addled eggs not ejected (D.N.T.). Shells picked up at distance from nest, but may be dropped quite close to it (D. Stubbert). No shells in nests containing young (C. J. Bellamy).

CORN-BUNTING (*Emberiza c. calandra*).

Egg-shells picked up at distance from nest and female known to remove them, but indirect evidence that she may also eat them. In one case two portions were fitted round an addled egg. Addled eggs not ejected (D.N.T.). Female seen flying away with dead chicks (F. Glenney and B. H. Ryves).

YELLOW BUNTING (*Emberiza c. citrinella*).

Female in some cases definitely known to remove shells to a distance. Addled eggs noted in nests containing young.

CIRL BUNTING (*Emberiza c. cirrus*).

Egg-shells evidently removed during hatch. Young, unhatched eggs, but no shells noted in nest in which hatching was in progress.

REED-BUNTING (*Emberiza s. schæniclus*).

Egg-shells found well away from presumed nest. Addled egg not ejected (D.N.T.). Egg-shells removed either by male or female as need arises (J. H. Owen). Some fragments are pulverised (S. Smith).

SNOW-BUNTING (*Plectrophenax n. nivalis*).

Female in one case flew away with large piece of shell in bill. No shells in nest that had contained young.

HOUSE-SPARROW (*Passer d. domesticus*).

Shells frequently found close to or even actually below nest (W. Marshall, R. Ware and D.N.T.). This was confirmed by C. E. Baker who noticed that smaller portion was frequently tucked inside larger. Shells found under nests (J. Markham). One shell carried 80 yards (A. Whitaker).

TREE-SPARROW (*Passer m. montanus*).

Carrying away of shells noted (D.N.T.). Shells found close to or even underneath nest (J. Markham).

WOOD-LARK (*Lullula a. arborea*).

Shells apparently removed to a distance. Addled egg not ejected.

SKY-LARK (*Alauda a. arvensis*).

Egg-shells removed as hatched. Discarded shell portions found. Addled egg not ejected.

TREE-PIBIT (*Anthus t. trivialis*).

Shells carried away by female. Addled egg not ejected (G. Tomkinson and D.N-T.)

MEADOW-PIBIT (*Anthus pratensis*).

Shells removed. Large fragments found in grass away from presumed nest.

ROCK-PIBIT (*Anthus spinoletta petrosus*).

Shells removed by sitter (D.N-T.). Some pieces trampled into lining (G. Arthur).

YELLOW WAGTAIL (*Motacilla f. flavissima*).

Female seen carrying away large portion of shell. Shells normally disposed of, but small fragments trampled into lining. Addled egg not ejected.

GREY WAGTAIL (*Motacilla c. cinerea*).

Shells removed by female. Small pieces trampled into lining.

PIED WAGTAIL (*Motacilla alba yarrellii*).

Large portions normally carried away by female, but occasionally dropped underneath nest. Small pieces trodden into lining. Addled eggs not ejected (C. and D.N-T.). Shell of Cuckoo's egg, hatched three days after their own, dropped on lawn 30 yards from nest; fosterer's egg-shells not found (G. Charteris).

WHITE WAGTAIL (*Motacilla a. alba*).

Shells of two eggs removed from nest (W. E. Teschemaker, *Avic. Mag.*, iv., p. 325).

BRITISH TREE-CREEPER (*Certhia familiaris britannica*).

Large fragments found well away from nest. None found below nest crevice. Small pieces noted in lining. Addled eggs not ejected (D.N-T.). Female seen carrying egg-shell from nest in shed. Dropped short distance away (D. Stubbert).

BRITISH NUTHATCH (*Sitta europæa affinis*).

Shells removed to distance (D.N-T.) No egg-shells noted in nests containing young (R. Ware and C. J. Bellamy).

BRITISH GREAT TIT (*Parus major newtoni*).

Large shell portions carried away by female (D. W. Musselwhite). This observation confirmed by R. Ware, who, in an examination of hundreds of nests of various species of tits, never found large shells remaining unless due to damage. Addled eggs not ejected (D.N-T.)

BRITISH BLUE TIT (*Parus cæruleus obscurus*).

Female removes large portions in bill (D. W. Musselwhite). Blue Tit—sex ?—emerged from nesting-box carrying large fragment of shell with which it flew to a tree and then dropped. (C. V. Stoney). Addled eggs not ejected (D.N-T. *et al.*), but in *Parus c. cæruleus* an addled egg was removed in bill (L.M. Dagley, *Brit. B.*, xxiii, p. 94).

BRITISH COAL-TIT (*Parus ater britannicus*).

Shells removed by female (D. W. Musselwhite). Shell portion found. Addled eggs not ejected (D.N-T.).

SCOTTISH CRESTED TIT (*Parus cristatus scoticus*).

Large shell fragments carried away by female as each egg hatches. Small pieces trodden into lining. Addled eggs not ejected.

BRITISH MARSH-TIT (*Parus palustris dresseri*).

BRITISH WILLOW-TIT (*Parus atricapillus kleinschmidti*).

Large portions of shell removed by female (D. W. Musselwhite).

BRITISH LONG-TAILED TIT (*Ægithalos caudatus rosaceus*).

Shells removed.

BRITISH GOLDCREST (*Regulus regulus anglorum*).

Large portions of shell removed. Fragment picked up in nesting wood. Very small pieces crushed into lining.

BEARDED TIT (*Panurus b. biarmicus*).

Shells removed. Fragment found in sedge (D.N-T.) Both sexes remove shells, dropping them occasionally over water, but generally in the sedge (J. Vincent).

RED-BACKED SHRIKE (*Lanius c. collurio*).

Disposal studied in detail by J. H. Owen who tells us : " Shells are normally carried any distance from 10 to 50 yards and dropped by female in flight. Sometimes the bird will carry them to a favourite perch, not far from the nest, and then drop them. Pellet remains are likewise treated. If the hatching period extends for more than one day the cock may similarly lift and dispose of a shell fragment, but he is more liable to take it to a favourite perch to drop and may even place shells on a horizontal rail on which he has a habit of perching. In one case a very large portion of shell was pinned up in the larder, quite 50 yards from the nest, on a blackthorn. This was undoubtedly the work of the cock as the hen has little if anything to do with the larder in the incubation and nesting periods." Large fragments were also found well away from the nest by D.N-T..

SPOTTED FLYCATCHER (*Muscicapa s. striata*).

Egg-shells removed. Large pieces found well away from nest. Small pieces crushed in lining. Addled eggs noted in a nest containing young.

PIED FLYCATCHER (*Muscicapa h. hypoleuca*).

Shells removed. Small pieces noted in nest lining (D.N-T.). Abnormal and shell-less eggs apparently destroyed by female. (C. V. Llewelyn, *Brit., B.*, xxvi, p. 95.).

CHIFFCHAFF (*Phylloscopus c. collybita*).

Egg-shells removed and one found well away from presumed nest. In *Sylviidæ* shell-carrying is apparently a common, if not general, practice.

WILLOW-WARBLER (*Phylloscopus t. trochilus*).

Bird—presumably female—seen flying with shell in bill. Large shell portions absent from nests with young (D.N-T.). Shells removed to distance and usually dropped at same spot. Removal occurs c.20 minutes after hatching (J. H. Owen, *Nat. Notes*, 1913). Some fragments pulverised. Addled eggs not ejected (S. Smith).

WOOD-WARBLER (*Phylloscopus sibilatrix*).

Shells removed, but no direct evidence as to share of sexes and method. Addled eggs not removed.

GRASSHOPPER-WARBLER (*Locustella n. naevia*).

Egg-shells removed. Exact details lacking (C. V. Stoney). Damaged eggs almost certainly removed on one occasion (D.N-T.). Addled eggs not ejected (J. Walpole-Bond).

REED-WARBLER (*Acrocephalus s. scirpaceus*).

Shells removed, but have been found beneath, or close to, as well as at a distance from, nest. Addled eggs not ejected.

MARSH-WARBLER (*Acrocephalus palustris*).

Egg-shells removed. Shell fragments found away from nest. No direct evidence as to sex responsible (P. M. Meeson).

SEDGE-WARBLER (*Acrocephalus schænobæus*).

Egg-shells removed, but sometimes found below nest as if dropped over edge. Addled eggs found in nests.

GARDEN-WARBLER (*Sylvia borin*).

Shells removed. No evidence as to sex responsible. Addled eggs found in nests.

BLACKCAP (*Sylvia a. atricapilla*).

Shells removed. Large shell fragment found well away from presumed nest (D.N-T.). Shells removed by both sexes and dropped in flight (J. H. Owen).

WHITETHROAT (*Sylvia c. communis*).

Hen removed large portion of shell, which it dropped while flying between two bramble-bushes (E. J. Hosking). Addled eggs noted in nests.

LESSER WHITETHROAT (*Sylvia c. curruca*).

Shells removed, but positive data lacking. Addled eggs not ejected (D.N-T.). Shell 80 yards from nest with newly hatched young (T. D. Weir in MacGillivray, *Hist. B. Birds* iii., p. 730).

DARTFORD WARBLER (*Sylvia undata dartfordiensis*).

Shells removed. Small pieces in lining (D.N-T.). Female actually seen carrying away egg-shell (Charles Read).

(To be continued).

OBSERVATIONS ON BLACK REDSTARTS BREEDING IN LONDON, 1941

BY

C. B. ASHBY.

THE Black Redstarts (*Phœnicurus o. gibraltariensis*) which spent the summer of 1941 in Westminster inhabited an area of private gardens and fair-sized buildings which had been damaged by air raids. I first made their acquaintance in the latter part of June, and at that time the cock was singing well, generally from some roof top, and occasionally high up on the Abbey. The young of the first brood had apparently become independent by then, for I never saw them with the adults. Indeed the only one I saw was on July 21st, when it was feeding in one of the gardens.

On June 27th, the parents were becoming interested in another nest, although they were still feeding the fledglings of their first brood, and by July 4th the hen was sitting again. This second nest, which was an untidy structure of dried grasses, with a small proportion of hairs and dirt fluff, together with several pieces of string, was situated on a wood beam in a porch, and had two approaches; the more general one through the archway over which the nest was built, and the other, less frequently used, through the rear of the damaged hall, part of the roof of which had gone. A view of the south approaches to the nest could be obtained from concealment in a building opposite, but from this point it was impossible to see either the nest or the north approaches to it. It is probable that visits by the parent birds from that direction were unrecorded, but subsequent experience suggested that this entrance was used comparatively seldom. Both parents commonly perched near the nest when bringing food and again after feeding, though this procedure was not invariably adopted. On each of the eight occasions on which excrement was seen to be removed it was by the cock, which flew directly from the nest, possibly to some distance, without perching. This is directly opposed to the observations of A. Comte (*antea*, Vol. xxxv, p. 92) who records "nest kept clean apparently by female alone." When the nest was examined after the young had left the cup was found to be clean, and the rim slightly soiled.

The intervals between feeds varied from one minute to twenty minutes, the parents remaining only a few seconds at the nest. During the day-time the nestlings were commonly fed at three-or-four-minute intervals, but less frequently during the evening. The delays in the feeding seemed to bear

no co-relation with weather conditions or other external influences, excepting in the special case of the second cock, to be described later. They were thought to be largely dependent on the moods of the parents and their preoccupation with necessary and pleasurable activities concerning their own welfare, such as eating and preening.

Date 1941	Number of feeds		Period	Average interval between feeds in minutes	Time p.m. B.S.S.T	Observers
	by cock	by hen				
July 17	10	8	2 hrs. 10 mins.	7.2	7.30-9.40	C.B.A.
" 21	8	7	2 hrs. 10 mins.	8.7	8.0-10.10	C.B.A.
" 23	1	2	1 hour	20.0	8.20- 9.20	C.B.A., C.A.W.
" 26	4	2	14 mins.	2.3	2.28- 2.42	A.L.N.R.
" 28	3	3	26 mins.	4.3	1.49- 2.15	A.L.N.R.
" 28	5	8	1 hour	4.6	7.10- 8.10	C.B.A., C.A.W.
" 29	2	4	22 mins.	3.7	8.30- 8.52	A.L.N.R.
" 30	2	0	1 hr. 45 mins.	52.5	5.45- 7.30	C.B.A., C.A.W.

Total 35 Total 34

The table shows that, at least during the periods watched, the task of providing the young with food was borne fairly equally by both parents, although the young of the first brood* had apparently been fed by the hen alone. It is interesting to note that on the 28th, when the three nestlings were nearly ready to leave, food was brought 13 times in an hour, as compared with 18 times in 2 hours and 10 minutes when the young were newly hatched. It was not always possible to see the nature of the food; sometimes no food could be seen in the bill of the parent though it went to the nest and the noise from the nestlings suggested that they were being fed. On a number of occasions the food brought obviously consisted of insects, though the precise nature of these remained obscure. Caterpillars were noted on two occasions.

A second adult male which frequented the nesting area on several dates between July 21st and 28th was not received with active hostility by the pair, which seemed tolerant, though they were clearly affected by his presence. The two cocks were twice seen to be following each other in flight, but whether this was an actual chase or not was not clear. On the first occasion when I saw this newcomer the parent cock arrived with food in its beak, and perched near the nest. Repeatedly it called, although generally the parents tended to be silent when feeding. Instead of proceeding immediately to the nest it delayed for five minutes, calling and flitting about, obviously slightly disturbed and undecided. Eventually it went in and fed, returning to a perch. It was then that the second cock appeared and alighted quite near the parent. I

* RUSSELL, A. L. N. R., *Country Life*, October 24th, 1941.

suspected that the intruder had been about, possibly in view of the parent cock, but out of sight from my position in the building opposite. The second bird was in good plumage, and was readily distinguishable from the rightful male, whose feathers were showing signs of wear and moulting. The parent hopped towards the intruder, which immediately flew off without offering any resistance. Indeed the parent made no aggressive show and may not have intended to hasten the departure of the second cock.

On the 23rd C. A. White accompanied me to the nesting area. As we arrived a cock Black Redstart flew down and we could see that its plumage was neat and splendidly black, with no sign of moult or wear. This was taken to be the second cock. White went to the hiding place and watched the south approaches, while I went to the north. Food was brought from this side only once, though occasionally one or other of the adults appeared on the roof tops. Presently one of the cocks appeared, and at the same time I made out another bird, too far off for plumage to be accurately determined, which I suspected was the other cock.

At 9.15 I heard the young being fed and shortly afterwards a cock flew out to the north bearing excrement, and, without perching first, darted through one of the window spaces of the damaged building and went out of sight. Later, when White and I compared the minute-by-minute notes each of us had kept it became apparent that the cock which had taken excrement away from the nest was the unmated intruder bird. This individual arrived to the south of the nest at 9.14, and remained on a coping for about a minute with insects in its beak, apparently hesitating to go to the nest. At 9.15 it flew into the nest and *was not seen to leave to the south*. The presence of the intruder appeared to have unsettled the parents, which fed the young only three times between 8.20 and 9.20. White saw the hen arrive several times at the south with food, departing three times without delivering, eventually going to the nest on the fourth.

Thus it was established that the intruder male had attached himself to the pair feeding young, and had so far assumed the duties of a mated cock as to feed the young and remove excrement from the nest. Although the parents were not seen to be actively hostile they were disturbed by the intruder and their efficiency in feeding the nestlings was impaired.

On July 29th one of the young birds left the nest during the morning, but returned after a few short flights. Later in the day the nest was examined from below and there was no sign

of the young, though at least one remained till the following day, when the cock brought food only twice in an hour and three quarters, while the hen did not appear. It is probable that one or more of the young had left and were in charge of the hen. It may have been that the cock was feeding less frequently as an inducement to the young to come out, but I think it is more likely that with the end of the breeding season very near the parental instincts of the cock had begun to wane. When eventually all the young had flown the cock took no further interest in them, and was never seen to feed them again.

By August 1st all three fledglings were out and about, assiduously attended by the hen. Thus it would seem that the fledging period was 17 days, which is consistent with Rayfield's account*. The cock, which was then well advanced in moult, was present, but actively searched the walls entirely for his own benefit.

After that date not more than two young birds were seen together and the fate of the third remains uncertain. On August 6th the hen was watched feeding two of them, one of which was beginning to pick up for itself, and one was again watched being fed by the hen on the 10th, while the other seemed quite independent. One of the two pairs watched by Rayfield fed the young for 15 days, and the other for about three weeks, after leaving the nest, but there seems to be no evidence of such attention in the case under review.

The moulting of the cock became so severe that by August 13th he was scarcely recognisable. New plumage was attained by early September, when the intense black of throat and breast was lacking, but a pale patch on the forehead, which had been noticed during the breeding season, was retained. No such marking was ever noticed on the intruder cock. Only one of the two cocks watched in Kent by Rayfield showed this patch, and it would seem from the *Handbook* to be unusual.

A very common utterance of the parent Black Redstarts was a trisyllabic call-note, not unlike that of the Common Redstart (*Phoenicurus ph. phoenicurus*) but less plaintive and with the last two syllables more accentuated. I heard it as "Eu-tuc-tuc." This call-note was adopted by the young ones about a week after leaving the nest.

A possible variant of this call, occurring in the form of a short quick rattle, which I described at the time as "low, harsh and purring," was heard on three occasions in June and July. Each time both parents were together, and I suspected

* RAYFIELD, P. A., *Brit. Birds*, Vol. xxxiv, p. 186.

that the rattle was due to the cock. A sound described by A. L. N. Russell as similar to that produced by rubbing two coins together is probably referable to this. It may have been a greeting note for the benefit of the hen.

The song was a simple repetition of a sequence which may be likened to "zree-zree-jee-jee-jee"; rapid, metallic and rising in pitch towards the end. To my ears the song was quite unlike the warbling performance described in the *Handbook*, and I could find no resemblance to the song of the Common Redstart.* The cock apparently went off song once the second brood was hatched, the last recorded date of regular song being July 20th. On August 1st, when the young birds had left the nest, a cock sang for a minute or so in the evening. Unfortunately the plumage was not seen well enough for the possibility of its being the intruder cock to be eliminated. However, I feel that it is probable that the unmated cock had moved on by then, and this was the parent cock, which had lost interest in the young. Intermittent song was again heard in the latter part of September and the beginning of October. These dates are in approximate conformity with those for W. Germany cited in the *Handbook*. It may be of interest to note that a Westminster bird started singing on March 14th, whereas song in W. Germany is said to commence at the end of March.

The utterances of the young birds varied with age. During the first days the note was shrill and mouse-like, but this became louder, stronger and harsher as they grew older. Once out of the nest their vocal efforts were seemingly at first confined to harsh, urgent chatterings when there was a chance of being fed, but after a few days I several times heard a rapid repetition of the ticking note to form a rattle resembling in some respects that of the Mistle-Thrush, but quite distinct from the rattle of the cock, already mentioned.

The author is indebted to the London Natural History Society for the use of its records, and to the following observers, whose notes have been invaluable:—Messrs. R. S. R. Fitter, J. E. Roberts, A. L. N. Russell, Dr. W. W. Thomson, Mr. C. A. White and Miss E. Williams. Special thanks are due to Mr. Russell, without whose ready cooperation much would have been lost.

* The song described is clearly not the typical full song, but the songs of different individuals of this species are far from constant in form and character. The phrase "details vary a little" in the *Handbook* should probably be strengthened. Kleinschmidt in the *Neuer Naumann* (Bd. I, p. 55) uses the expression "extraordinarily variable."—B. W.T.

NOTES

BLACK REDSTARTS IN LONDON, 1941.

IN 1941 for the second year in succession a pair of Black Redstarts nested twice near Westminster Abbey. At least three other singing males were reported in Inner London.

At Westminster a cock was first seen on March 14th and the hen in the middle of April by A. L. N. Russell. On April 28th I thought I heard a second cock singing, and on May 31st definitely established its presence. This bird flew off towards Great College Street. An unsubstantiated report states that the remains of a Black Redstart were found nearby on or immediately before May 10th, so that it is possible that there were at one time four of these birds around the Abbey. The first nest was located in the cowl of a stove-pipe about 50 feet above the ground by A. L. N. Russell on June 17th, at which time the young were very noisy and being fed by the hen. By the morning of June 20th the young had flown. Only two young birds from this brood were ever seen, and it is surmised that the rest of the brood may have perished from heat in the stifling atmosphere of the cowl—there was a heat-wave at the time.

On June 27th Dr. W. W. Thomson saw the old birds taking an interest in a nest over the inner archway of the Old School Gate. This nest, which Dr. Thomson ascertained to be empty, is apparently the same nest as that used for the second brood of the pair which bred at Westminster in 1940 (see *London Bird Report* for 1940, p. 8). On June 27th the old birds were still carrying food for the young of the first brood. On July 4th Dr. Thomson saw the hen sitting on this nest. On July 14th A. L. N. Russell, P. A. D. Hollom and myself saw both old birds carrying food to the young in the second nest. The first young bird flew from this nest on July 29th, and by August 1st all had flown. The young were frequently seen in the neighbourhood during August. The old birds remained there during the autumn, and both were last seen on October 10th (A. L. N. Russell).

Elsewhere in London in 1941, a cock Black Redstart frequented the British Museum (Natural History) in South Kensington for the fourth year since 1927. It was seen or heard frequently between April 15th and June 11th. Another singing cock was reported from the ruined area north and west of St. Paul's Cathedral, most often in Foster Lane and Cannon

Street, between June 17th and July 23rd. It was seen or heard by four observers (Mrs. M. S. Fitter, D. W. Musselwhite, E. G. Pedler, A. L. N. Russell). An unsubstantiated report says that a pair were seen or heard in the Foster Lane area for a fortnight prior to June 18th, so it cannot be assumed that this was the South Kensington bird changing its territory. In this connection A. L. N. Russell says that he is now fairly certain in identifying as a Black Redstart's a song he heard in St. Paul's Cathedral in the early summer of 1940.

R. S. R. FITTER.

BEWICK'S SWANS IN WARWICKSHIRE.

IN view of the considerable rarity of Bewick's Swan (*Cygnus b. bewickii*) in Warwickshire, it is interesting to be able to record the presence of five of these birds, on December 26th and 27th, 1941 on the lake at Wootton Wawen.

Three of the birds were adult and two juvenile. The young birds were much more uniformly greyish in colour than I should have expected at this time of year. As far as we could see there was no trace of white either on the mantle, flanks or on the wings, the whole appearance being, as I have said, uniformly greyish.

The native Mute Swans (*Cygnus olor*) of which there were six, seemed to resent the intrusion and repeatedly made for the Bewick's in a threatening manner if the latter ventured within 25 yards or so.

There appear to be only two previous records for the county of this species. One from Sutton Coldfield, January 11th, 1918 to March 22nd, 1918 (*cf.*, *antea*, Vol. xi, p. 233) and two seen at Stoneleigh Park, November 16th, 1918 (*cf.*, *antea* Vol. xii, p. 162).

C. A. NORRIS.

ICELAND GULL IN SURREY.

ON December 15th, 1941 we saw an Iceland Gull (*Larus glaucoides*) among a mixed group of gulls on the side of a reservoir in Lonsdale Road, Barnes, Surrey. The bird was approximately equal in size to a neighbouring Herring-Gull and was in immature plumage. This would appear to be the second record for Surrey (*vide antea*, Vol. xxxiii, p. 28).

T. BISPHAM AND W. R. PHILIPSON.

LATE HOUSE-MARTINS IN ISLE OF MAN AND SUSSEX AND SWALLOW IN CHESHIRE.—Mr. G. Clementson informs us that he saw three House-Martins (*Delichon u. urbica*) at Peel, Isle of Man on December 3rd, 1941. Mr. J. Walpole-Bond writes

that he observed a single House-Martin at Hove on December 2nd.

Flying Officer E. Cohen reports an immature Swallow (*Hirundo r. rustica*) seen by him on December 26th, 1941 near Macclesfield.

REVIEWS.

Herefordshire Birds. By Captain H. A. Gilbert and C. W. Walker, M.C., M.D. (Hereford : Herefordshire Times, Ltd.)

As existing accounts of the birds of Herefordshire are much out of date, this booklet, though brief and confined to those birds which breed regularly in the county or can be ranked as regular visitors, is very welcome. One hundred and thirty-six birds are included, of which one hundred and twelve breed or have bred. A brief but well considered account of the present status of each bird is given and for comparison an epitome of the statements of previous writers. There is an interesting variety of birds in the county. The Reed-Warbler breeds in one area, the Marsh-Warbler has bred and the Nightingale reaches the eastern half and yet it is a county in which also the Raven, Pied Flycatcher, Ring-Ouzel, Buzzard, Common Sandpiper and Red Grouse all breed. The Raven returned in 1924, but has increased very slowly and there are only a few pairs, all nesting in trees. The slow increase is put down to scarcity of carrion except on hills where there are sheep. The Buzzard returned during the last war and is increasing. Besides being very useful this account should lead to a more detailed knowledge of the distribution of many of the species described and it is to be hoped that the authors will later produce a critical list of the rare visitors combined perhaps with the present list revised.

Handbook of Birds of the Malvern District. By Jeffery G. Harrison, (Univ. of London Press Ltd.) 2s. 6d. net.

MALVERN has had two previous lists of birds compiled by masters at the college, but the present book written by a school boy is more ambitious. The area covered is extensive and not very well defined. It appears to include most of south-west Worcestershire and spreads into Gloucestershire and Herefordshire. A sketch map would have been a useful addition. The accounts of each bird as it affects the district are carefully drawn out though it is not always quite clear if the bird now breeds in the area and some of the scarce visitors included might have been enclosed in square brackets—sight observations of most sub-species are for example very unsatisfactory. Some general remarks as to appearance and so on are introduced in most of the species and no doubt these will be useful, but some mistakes have crept in, for instance the statement that Continental Goldcrests spread out over England, for which we have no evidence, that Shags are more commonly seen inland than Cormorants, the reverse being the case, and that Dippers do not walk along the bottom, concerning which the author should consult the *Handbook* (Vol. ii. p. 222). The book is printed on one side of the paper leaving the opposite page blank for notes and it is to be hoped that Malvern will have in the future many who will make good use of these blank pages. Meanwhile we may congratulate Mr. Harrison on having laid a good foundation for a more complete knowledge of the birds of the district.

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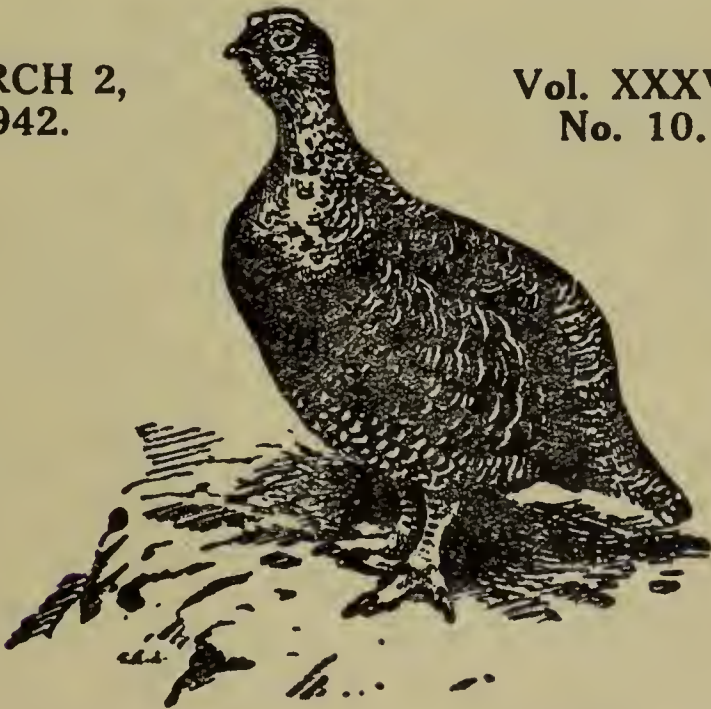
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PUBLICATION OF THE BRITISH TRUST FOR
ORNITHOLOGY.

THE INDEX OF HERON POPULATION, 1941.

BY

W. B. ALEXANDER.

THE number of Heronries concerning which reports were received by the Edward Grey Institute this year was 132, or 15 more than in 1940*. In existing circumstances this must be regarded as very satisfactory, though unfortunately the number of those included which have been counted regularly since the annual Sample Census was inaugurated is considerably smaller than last year. For various reasons many of our regular informants were unable to visit the heronries on which they have been accustomed to report. Lack of leisure or of petrol is partly responsible for this decrease, but a good many heronries are situated in places now closed to the public. Major A. W. Boyd has supplied figures for nearly all the known heronries in Cheshire and S. Lancashire, the late Mr. H. B. Booth for most of those in the West Riding of Yorkshire, Mrs. Hodgkin for a number in Northumberland, Mr. E. M. Cawkell for several in Sussex and Kent, and the Rev. P. G. Kennedy for 18 in seven different counties in Eire. Owing to the efforts of Messrs. P. A. D. Hollom, J. Fisher and R. A. Hinde more information was received from East Anglia than in any year since 1928.

Several heronries not previously recorded have been reported. One in Buckinghamshire had at least 8 nests this year and has existed for 7 years, if not longer. Mr. J. Stevenson sent information of two small heronries in Co. Londonderry and Father Kennedy of one containing 2 nests in Leix seemingly new. Two hitherto unrecorded sites in Essex have also been reported. One contained two nests in 1940, at the other a single pair has nested for some 20 years. In a park in Warwickshire one pair usually nest, whilst Mrs. Whitehead reported a single nest on the cliffs of Ramsey Island, Pembrokeshire.

At Coley Park, Reading, all the 12 occupied nests were this year in a single large plane-tree.

Of the 132 sites on which reports were received 10 were abandoned. All of these were quite small heronries (of 4 nests or less) and in 5 cases the trees where the birds nested had been felled. It is possible that in some cases the birds may

* See *Brit. B.*, Vol. xxxiv, pp. 189-194.

have nested in a new site which was not discovered. One site which was abandoned in 1940 owing to disturbance by a military camp was reoccupied in 1941.

Of the 122 heronries counted this year 90 were also counted in 1940 when they contained 1,304 nests. In 1941 they only contained 1,248 nests, a decrease of 4 per cent.

Of the heronries in England and Wales included in the 1928 census we have figures for 74 this year. These contained only 1,318 nests as against 1,716 in 1928, giving an index of 77. Last year's index based on 1928 was 86 which at first sight suggests that there has been a further decrease of 9 per cent., but it is probable that most of this apparent decrease is due to the inclusion in this year's sample of considerably more heronries in eastern England, the region which suffered most severely from the cold spell early in 1940.

In recent years we have substituted an index based on 1936 for that based on 1928, as giving a more reliable figure, but this year we only have figures for 62 heronries in England and Wales and for 67 heronries in the British Isles which were counted in 1936. These give an index for England and Wales of 74 (last year 73) and for the British Isles of 73 (last year 74). It has been emphasised in previous reports that the ideal at which we have aimed is to get counts of the same selected sample of heronries made by the same observers each year. In present circumstances this ideal is unattainable and the problem with which we are faced is to make the best use of the information we have received. It has been mentioned above that out of 122 heronries for which we have figures this year only 74 were included in the 1928 census and only 67 were counted in 1936. The year 1936 was adopted as a basis in addition to, or substitution for, 1928 because in that year the index based on 1928 was again 100, but in the three following years 1937, 1938 and 1939 the index was again 100 (or 99 or 101, but differences of one per cent. are well within the margin of error). In order to utilize our returns more fully it seems best to adopt as our basis in future the average of the counts in these 5 years or of as many of these figures as are available. On this basis we can use this year the figures for 109 out of the 122 counted and the index works out at 73 (the same as the index based on 1936 alone).

The index for 1940 calculated on this basis was 78, though on the 1936 basis used in last year's report it was given as 74. It would appear therefore that there has been a further decrease in the Heron population of about 5 per cent.

The percentages for individual regions for the last two years calculated on the new basis are as follows :—

			1940	1941	CHANGE
South-west England ...	...	...	99	76	—23
South-east England ...	...	...	38	43	+ 5
Thames Drainage Area ...	...	...	88	81	— 7
Eastern England ...	...	...	71	69	— 2
Midlands ...	...	...	71	79	+ 8
Wales and Borders ...	...	...	87	71	—16
North-west England ...	...	...	82	83	+ 1
North-east England ...	...	...	90	87	— 3
Ireland ...	...	...	78	68	—10
<hr/>					
England and Wales ...	...	...	78	73	— 5
British Isles ...	...	...	78	73	— 5

In view of the comparatively small numbers on which the percentages for individual areas are based it is doubtful whether changes of less than 10 per cent. are significant. It will be seen that in no area was an increase of this magnitude recorded but that in south-west England, Wales and Ireland there were decreases of 10 per cent. or more. It seems somewhat doubtful whether these decreases can be correlated with weather conditions, though it is suggestive that all three areas are adjacent to the Irish Sea. In some parts of Wales the weather at the beginning of the year is said to have been as severe as in the preceding winter, but it appears that this was due to much more snow and that there was no such prolonged spell of frost, so that the rivers were never completely frozen. These conditions were shared with the north of England and the north Midlands, where no great change in the Heron population occurred, but as far as we are aware, the winter in south-west England was not specially severe. Northern Ireland experienced a severe spell of weather, but we have not heard that conditions were unusual in Eire where most of the heronries included in the sample are situated.

No reports have reached us of unusual mortality during the winter, but the effect of war conditions is reflected in the number of instances where decrease or disappearance of heronries is attributed to tree felling. A few reports have also been received of deliberate interference with the nesting birds by soldiers camping in the vicinity. In one case it is thought that Herons may have deserted their nests owing to heath-fires in the neighbourhood started by bombs, but in a heronry near London the numbers nesting were up to the average in spite of the din of anti-aircraft batteries at night.

In three considerable areas all, or almost all, the known heronries were counted in 1941 and thus provide a check on

the general sample. In the Thames Drainage Area the count was complete except for one small outlying heronry in Surrey. The number of nests counted this year was 267 in 17 heronries, as against 303 in 16 heronries in 1928, giving an index of 88.

Major A. W. Boyd obtained figures for all the known heronries in Cheshire and S. Lancashire except one small one in Cheshire. In 1941 the nests reported numbered 210 in 7 heronries, as against 173 in 8 heronries in 1928, giving an index of 121. This favourable result is almost entirely due to a great increase in the heronry at Eaton Hall where 98 nests were reported this year. It is probable that this is now the largest heronry in England since the 5 heronries which in 1928 contained over 80 nests were all visited this year and none of them approached that figure.

Mr. P. A. D. Hollom made a survey of the heronries in a large area of Suffolk which in 1928 contained 6 of the 9 heronries reported from that county and in which a seventh was reported in 1932. Only 4 of these heronries still survive and these contained 69 nests as against 118 nests in the same area in 1928. This is a percentage of 58 and confirms the indication of the general sample for eastern England that the decrease in that area has been much greater than in most others.

It will be seen that no recovery of the Heron population from the serious setback it sustained in 1940 has yet occurred. On the contrary there has been a small further decrease. We are most grateful to all those who supplied information in 1941 and thus assisted us to follow the fortunes of British heronries at this interesting period, and it is hoped that all those in a position to visit one or more heronries in 1942 (if possible between April 15th and May 10th) will send figures to the Edward Grey Institute at Oxford.

EGG-SHELL DISPOSAL BY BIRDS

BY

CAROLINE AND DESMOND NETHERSOLE-THOMPSON.

*(Continued from page 200).*MISTLE-THRUSH (*Turdus v. viscivorus*).

Large shell fragments sometimes carried away by parent (C. and D.N-T.). Parents swallowed pieces of shell after young had hatched (N. M. Richardson, *Proc. Dorset N.H. and A.F.C.*, xxiii, p. 67.).

BRITISH SONG-THRUSH (*Turdus e. ericetorum*).

Method variable. D.N-T. and other observers have watched a Thrush remove and fly away with an egg-shell after hatching. Distance to which shells are carried varies from c. 20 to 100 yards. Miss O. S. Wilshire also watched a Thrush remove and then eat a shell. In an experiment made by Miss F. Pitt (*Country Life*, 27.7.40. p. 75) a bird with small young broke into small pieces and ate a shell placed in nest, and flew away with a second. Shell removal also filmed in 1941 (F. Pitt). One half of shell often tucked inside other (C. E. Baker). Addled eggs not removed and damaged egg may be trampled into nest during fledging (J. Markham).

RING-OUZEL (*Turdus t. torquatus*).

Shells eaten or removed. Large fragment once picked up in nesting area.

BLACKBIRD (*Turdus m. merula*).

Female seen with shell in bill. Addled eggs not ejected (D.N-T.). Many shells found, small half often inside large half (F. C. R. Jourdain and C. E. Baker).

WHEATEAR (*Ænanthe æ. ænanthe*).

Shells removed. Female seen carrying shell and many found in nesting areas. Small pieces crumbled in lining.

WHINCHAT (*Saxicola r. rubetra*).

Egg-shells removed as hatched. In one case observed female carried shell in bill.

BRITISH STONECHAT (*Saxicola torquata hibernans*).

Egg-shells removed during hatch. Shell found in nesting area. Small fragments trodden into lining.

REDSTART (*Phœnicurus ph. phœnicurus*).

Shells removed. Small pieces trodden into lining. Addled eggs not ejected.

BLACK REDSTART (*Phœnicurus ochrurus gibraltariensis*).

Large portions evidently removed. Only small pieces noted in nests examined in Switzerland (D.N-T.). Shells from nest in hut were carried a few feet towards doorway and dropped (W. M. Congreve).

NIGHTINGALE (*Luscinia m. megarhyncha*).

Female seen removing shells after hatching (R. Morris, *Zool*, 1914, p. 149). Shell noted in beak of sitting bird after two young had hatched, later removed and dropped in flight. All shells removed (X. Raspail).

BRITISH ROBIN (*Erithacus rubecula melophilus*).

Shells removed during hatch. Small pieces in lining. No direct observation (D.N-T.) Egg-shells disappear within very short period after hatching (O. R. Owen). Sitter seen to drop shell some yards from nest (J. H. Owen).

BRITISH HEDGE-SPARROW (*Prunella modularis occidentalis*).

Shells removed. Addled or damaged eggs not ejected (J. Markham). Egg-shells found quite close to a nest containing young. Small pieces crumbled in lining (W. Marshall and D. Stubbert).

WREN (*Troglodytes t. troglodytes*).

Shells removed. Small pieces in nest lining (C. and D.N-T.). No large shell portions in nests containing young (C.J. Bellamy).

BRITISH DIPPER (*Cinclus c. gularis*).

Bird—presumably female—seen to emerge from nest with shell in bill. Shells removed from nests with young examined by us. A few small pieces trampled into nest.

IRISH DIPPER (*Cinclus c. hibernicus*).

Shells removed. Behaviour probably same as that of British race.

SWALLOW (*Hirundo r. rustica*).

Large portion of shell found below nest. Some shell-pieces crumbled in lining. Addled eggs noted in nests containing young (C. and D.N-T.). Usually carried away and dropped, but one often scratched over side of nest (J. H. Owen, *Brit. B.*, xi. p. 226).

HOUSE-MARTIN (*Delichon u. urbica*).

Large shell portions removed. Some shell crumbled in lining (D.N-T.). Halves of two used shells found on pavement short distance from where birds were nesting and several also picked up beneath nests. Removal to distance apparently normal method (F. C. R. Jourdain). Shells dropped immediately below nest (G. Charteris and O. R. Owen). Appearance of young announced by broken egg-shells under nests (T. Hepburn in MacGillivray, *Hist. Br. Birds*. iii. p. 587).

SAND-MARTIN (*Riparia r. riparia*).

Quite large portions crumbled in nests containing young, but some definitely removed.

SWIFT (*Apus a. apus*).

Some crumbled pieces of shell noted in nest from which young had flown, but no complete observation as to disposal of large portions (D.N-T.). Shells apparently removed (J. H. Owen).

NIGHTJAR (*Caprimulgus e. europæus*).

Method variable. Large portions of shell found in or close to nest, often large half containing smaller, but several times picked up well away and evidently carried off (D.N-T.). "Shells carried away in every case under observation (under 50)" (J. H. Owen). Chipped egg-shells lying within a few inches of young quite a week old (A. Whitaker). Non-removal of shells also noted as only method by J. S. Walton, *Brit. B.*, iii, p. 196, E. B. Dunlop, R. H. Read, *et al.*

KINGFISHER (*Alcedo atthis ispida*).

Female partly surrounded by hatched shells, male then brought a fish and emerged carrying one, possibly two shells, one inside the other, and trailing another out in feet. Next day no shells in nest-chamber and only one in vicinity of nest-hole (R. L. Brown, *Brit. B.*, xxvii, p. 257). Shells carried away and dropped (J. H. Owen). No shells noted in nests containing older young (C. J. Bellamy), but found in nests containing small young (F. C. R. Jourdain). Some crumbled shell pieces also noted by D.N-T.

BRITISH GREEN WOODPECKER (*Picus viridis pluvius*).

Large fragment of shell found in nesting-wood. Carrying therefore, occurs (D.N-T.). Shells carried by parents to distance and then dropped (J. H. Owen and A. Burdet, evidence of latter in *Nos Oiseaux*, 1919, p. 169). In nest containing small young were large portions of shell, halves neatly pushed inside one another (F. C. R. Jourdain).

BRITISH GREAT SPOTTED WOODPECKER (*Dryobates major anglicus*).

In one case an egg-shell was probably eaten. No shells found below nest-holes and with exception of a few splinters all moved from nests containing young (D.N-T.). Shells carried away and dropped (J. H. Owen and N. Tracy). In *Dryobates m. major* male carried dead chick over 40 yards. Later shells, also found at distance from nest (O. Steinfatt, *Beitr. Fortpfl.-biol. Vögel*, 13, 1937, p. 54). No egg-shells in nests containing young (R. Ware and C. J. Bellamy).

BRITISH LESSER SPOTTED WOODPECKER (*Dryobates minor comminutus*).

Shells carried away and dropped (J.H. Owen). No shells found below nests containing young and only very small shell-pieces found in nest-chamber (D.N-T.). Four addled eggs and one small young from which shell had been removed in one nest-hole (C. J. Bellamy).

WRYNECK (*Jynx t. torquilla*).

Shells removed. Very few fragments noted when young in nest (R. Ware and D.N-T.). Shells removed by parents (J. H. Owen).

LITTLE OWL (*Athene noctua vidalii*).

Shells largely eaten or removed. None noticed under nests containing young (C. J. Bellamy and D.N-T.). Large fragments usually taken to short distance from nest (J. H. Owen). Shell of first egg hatched pounded by female into minute fragments soon after hatching (in captivity). A few pieces of second on floor of cage outside nest. Possibly eaten by female (T. E. Gunn, *Zool.*, 1886, p. 475). Both large portions of shell found at mouth of nest-hole, but next day they had been removed (E. J. Hosking).

LONG-EARED OWL (*Asio o. otus*).

Shells removed shortly after hatching. Large fragments picked up on heath (D.N-T.). Shells often tipped over nest, but sometimes carried right away (J. H. Owen). Carried away apparently by hen (E. J. Hosking).

SHORT-EARED OWL (*Asio f. flammeus*).

Shells removed. Small pieces only in nest containing young (D.N-T.). Shells pitched out or carried short distance and then dropped. Addled eggs not ejected (J. Vincent and G. Arthur). One large and many small pieces in nest in which smallest chick was very young. In second nest containing larger young no shell remains whatever. At third nest from which young had gone, one large and many small pieces (E. B. Dunlop). Hen did not react to shell of bantam placed in nest and this was eventually crushed into small pieces (F. Pitt).

BRITISH TAWNY OWL (*Strix aluco sylvatica*).

Reaction variable. Large shell-pieces found almost below open nest from which they had evidently been ejected. Small pieces only in nest-holes containing young (C. and D.N-T.). Shell fragments found away from nest (A. Whitaker and W. Marshall). Large portions normally removed to short distance (J. H. Owen). At one nest shells lying broken under three young. At another containing two young and one chipped egg, shells also lying in nest (E. B. Dunlop). Shells not ejected (D. Stubbert). No large shell fragments in nests containing young (C. J. Bellamy).

BARN-OWL (*Tyto a. alba*).

Mr. J. H. Owen writes : "The Barn-Owl seems least inclined to remove shells and I have watched nests in which these were left absolutely undisturbed on the edge of the cup or area in which the young were lying.....All the other (British) Owls seem to pay more attention to hygienic principles than the Barn-Owl." Shells noted in nest containing two young (E. B. Dunlop). During hatch shell noted, but later small pieces only (D.N-T.). Large shell portions not noted in nests containing young (C. J. Bellamy). In one case shell either eaten or removed directly after hatching (E. J. Hosking).

PEREGRINE FALCON (*Falco p. peregrinus*).

An egg-shell found below one eyrie, but strong evidence for supposing that shells sometimes eaten (C. and D.N-T.). All shells of three hatched eggs lying in far corner of eyrie (E. B. Dunlop). In eyrie containing small young, shells still in nest (D. A. Scott, *Wild Life*, viii., p. 262). Addled eggs not ejected (D.N-T.) but P. M. Meeson watched female eating damaged egg. Fragments of broken egg found in eyrie containing three slightly incubated eggs (D.N-T.).



MERLIN: Hen covering egg and three hatched young. Note fragment of shell in bill and remains round nest. Shell largely eaten.

(Photographed by E. J. Hosking.)

HOBBY (*Falco s. subbuteo*).

Large shell portions may be carried away or dropped over edge of nest, but in some cases apparently broken up and eaten. Addled eggs not ejected but damaged egg may cause desertion (D.N-T.). Female seen to drop fragment of shell over nest (F. Haverschmidt). Shells not removed, but pounded into minute fragments by weight of young birds (K. Morris in lecture to *Zool. Soc.* 11.2.36).

MERLIN (*Falco columbarius æsalon*).

Female breaks up and eats shell (E. J. Hosking). This method was also used by another female in 1941 (D.N-T.). Only one fragment in nest; shells apparently removed (H. A. Macpherson, *Vertebrate Fauna of Skye*, p. 173).

KESTREL (*Falco t. tinnunculus*).

Egg-shells removed and in some cases definitely dropped under or close to nest site. Addled egg not removed. Broken egg not always removed.

GOLDEN EAGLE (*Aquila ch. chrysaëtus*).

Strong evidence that female breaks up and eats most of hatched egg-shell. In one case addled egg was almost certainly removed but this is not a general practice.

COMMON BUZZARD (*Buteo b. buteo*).

Egg-shell found in nesting wood, but in some cases probably largely eaten, although some pieces crumbled up. Addled egg not ejected (D.N-T.). Large pieces of shell on side of nest with chicks. Much broken up shell in cup and half shell on side of another nest (E. B. Dunlop).

MARSH-HARRIER (*Circus æ. æruginosus*).

Female ejects shells over edge of nest or carries them to a distance of 20 to 100 yards before dropping them. Addled eggs not ejected (J. Vincent).

MONTAGU'S HARRIER (*Circus pygargus*).

Shells are either dropped over edge of nest or carried up to a distance of 100 yards from it (J. Vincent). Female broke into small pieces and then ate both halves of a shell (C. W. R. Knight in film "Aristocrats of the Air.").

HEN-HARRIER (*Circus c. cyaneus*).

Piece of shell noticed below nest and one apparently eaten (D.N-T.); normal method is, however, for female to pick up and carry them away (G. Arthur and J. Douglas). Small pieces crumbled into nest fabric (R. Chislett). Hen picked up and carried away piece of domestic fowl egg inserted in nest containing small young (F. Pitt, *Country Life*, March 4th, 1939). Female also photographed with shell in bill about to remove it from nest (Miss Maxse, *Field*, January 6th, 1940).

SPARROW-HAWK (*Accipiter n. nisus*).

Some shells dropped over nest-edge, others probably eaten. Latter probably usual method. Addled eggs not ejected (D.N-T.). During hatching of two broods shells placed by female on edge of nest and munched up at leisure. One shell blown to ground by gust of wind. Shells may also be carried away and dropped (J. H. Owen, *Brit. B.*, x, p. 110). After first egg hatched hen stood on nest flapping wings for fully half a minute. Shell lifted on to side of nest, held in claws, and eaten

after being brooded 30 minutes. Second and third eggs similarly treated. Chicks appeared to resent presence of infertile egg (Stanton Whitaker).

KITE (*Milvus m. milvus*).

Only small shell pieces noted in nest containing young. Addled egg not ejected (D.N-T.). Shells found at foot of nesting tree (G. Thiede and A. Zänkert, *Beitr. Fortpl.-biol. Vögel*, II, 1935, p. 124).

HONEY-BUZZARD (*Pernis a. apivorus*).

Most of shell eaten or removed. No trace in nest with young. COMMON HERON (*Ardea c. cinerea*).

Egg-shells very often dropped over nest edge. Some pieces definitely broken up in nest (D.N-T and many other observers). No evidence of carrying (J. H. Owen).

BITTERN (*Botaurus s. stellaris*).

Shells ejected over side of nest by female or carried a few yards and then dropped (J. Vincent). Two halves of shell which had hatched in her absence were lifted by female and pushed in turn under water. Membrane adhering to chicks removed and eaten. (F. Pitt, *Country Life*, 1937, pp. 598-600). Shell carefully sunk in water (Lord W. Percy, *Country Life*, June 23rd, 1934). On placing shells in nest above procedure repeated (W. Percy and F. Pitt). Addled egg and small shell pieces not ejected (E. L. Turner). Shell ejection photographed by E. Hosking.

WHOOPEE SWAN (*Cygnus c. cygnus*).

Captain W. P. B. Beal, superintendent at Whipsnade Park, writes of the birds that nested there: "The egg-shells of the Whooper Swans hatched in 1939 brood were left in nest. In 1941 they nested and hatched more young and egg-shells were again left in nest."

MUTE SWAN (*Cygnus olor*).

Shells remain in or pitched over side of nest.

*GREY LAG-GOOSE (*Anser a. anser*).

CANADA GOOSE (*Branta canadensis*).

Shells and addled eggs not ejected.

SHELD-DUCK (*Tadorna tadorna*).

Shells and addled eggs not normally ejected. Shells are, however, occasionally pushed or lifted out of nest and may be covered in down when ducklings leave. Many records of shell remains being found under fresh clutch of eggs. Non-removal of shells is apparently an almost universal practice among

* Non-removal of at least a substantial amount of egg-shell is apparently general among geese [e.g. Lesser White-fronted Goose (*Anser erythropus*) Pink-footed Goose (*Anser f. brachyrhynchus*) and Barnacle-Goose (*Branta leucopsis*). (F. C. R. Jourdain and W. M. Congreve).]



BITTERN removing empty shell from which a chick has just been hatched.
The wet chick can be seen. (*Photographed by Frances Pitt.*)

ducks, but T. Southwell (*Brit. B.*, ii, p. 61) records having found shell fragments outside a burrow from which young had hatched.

MALLARD (*Anas p. platyrhyncha*).

GADWALL (*Anas strepera*).

TEAL (*Anas c. crecca*).

Shells not removed.

GARGANEY (*Anas querquedula*).

Shells not removed (P. M. Meeson).

WIGEON (*Anas penelope*).

Shells not removed. Addled eggs not ejected.

PINTAIL (*Anas a. acuta*).

Shells not removed. (P. M. Meeson).

SHOVELER (*Spatula clypeata*).

COMMON POCHARD (*Aythya f. ferina*).

TUFTED DUCK (*Aythya fuligula*).

Shells not removed. (D.N-T. and others).

SCAUP (*Aythya m. marila*).

A quantity of broken shell in nest containing highly incubated eggs, thus proving use in previous year or years (P. H. Bahr, *Brit. B.*, ii, p. 216).

COMMON EIDER (*Somateria m. mollissima*).

Shells and addled eggs not ejected (F. C. R. Jourdain, etc.).

Down pulled over shells when young left (F. Pitt).

COMMON SCOTER (*Melanitta n. nigra*).

Shells not removed.

GOOSANDER (*Mergus m. merganser*).

Egg-shells and addled eggs not ejected, but W. M. Ross says that addled egg of a former year was removed by female and carried away (*Brit. B.*, xxxii, p. 154). Old shells of former year found under current year's clutch (A. Whitaker).

RED-BREASTED MERGANSER (*Mergus serrator*).

Shells and addled eggs not ejected (D.N-T.). Old shells of former year found under clutch of current year (A. Whitaker).

CORMORANT (*Phalacrocorax c. carbo*).

Shells pitched on to rocks or into stagnant water (E. B. Dunlop and D.N-T.). Some pieces trampled into fabric (G. Arthur and R. M. Lockley).

SHAG (*Phalacrocorax a. aristotelis*).

Shells pitched out of nests (E. B. Dunlop and D.N-T.). Quite large fragments trampled into fabric (R. M. Lockley and G. Arthur).

GANNET (*Sula bassana*).

Some shell-remains crushed in nests, but some large portions may be ejected. No direct observation (D.N-T.). Shell trampled into nest (R. M. Lockley).

STORM-PETREL (*Hydrobates pelagicus*).

Shell remains in nest-hole (G. Arthur), but D.N-T. once found used shell-portion on rocks below. Egg-shells and unhatched eggs always left in nests (A. Gordon, *Brit. B.*, xiii, p. 234). Exceptionally shell removed and carried out into passage or dropped outside (R. M. Lockley, *Brit. B.*, xxv, p. 209). In nest containing young about two weeks old, egg-shell lying beside it and not even separated into two pieces (S. P. Gordon, *Brit. B.*, xxiv, p. 246).

LEACH'S PETREL (*Oceanodroma l. leucorrhoa*).

Shell not removed (J. A. Ainslie and R. Atkinson, *Brit. B.*, xxx, p. 239). Ditto (T. H. Harrisson). Unhatched or broken egg not ejected from burrow (A. Whitaker). "If the egg became accidentally cracked or the birds deserted through our interference the egg was sometimes left for 2 or 3 days after which one of the parents would return and brood it for a single night before deserting totally" (J. Ainslie and R. Atkinson, *antea*, xxx., p. 239.)

MANX SHEARWATER (*Puffinus p. puffinus*).

Mr. R. M. Lockley, whose experience of this species is extensive, writes: "Egg-shells of Shearwaters (Manx and North Atlantic Great Shearwater) seem to vanish as soon as chick is dry, but whether or not the adult eats it, I cannot say." Absence of shells also noted by R. Ware and T. L. Patey, but G. Arthur has found shell-remains in holes.

FULMAR PETREL (*Fulmarus g. glacialis*).

Pieces of crumbled shell noted in nest containing young.

GREAT CRESTED GREBE (*Podiceps cristatus*).

Egg-shells removed, but large empty shell-portion may at first be brooded by sitter. Shell found in water some distance from nest. Some smaller pieces not ejected and addled eggs allowed to remain (D.N-T.). Female photographed in act of removing shell (E. L. Turner, *Zool.*, 1907, p. 126).

SLAVONIAN GREBE (*Podiceps auritus*).

Large portions removed. Small pieces and addled eggs unejected.

BLACK-NECKED GREBE (*Podiceps n. nigricollis*).

Shells removed. Large fragment found in water close to nest. Smaller pieces and addled eggs noted in nests.

LITTLE GREBE (*Podiceps r. ruficollis*).

Large portions normally removed. Smaller pieces trampled into fabric (D.N-T.). Two unhatched eggs and broken shells noted in a nest (F. C. R. Jourdain). Shells cleared from nest but not taken far (J. H. Owen).

(To be continued).

THE MUTE SWAN AND THE 20-10 SECONDS RULE

BY

THE LATE J. M. DEWAR, M.D.

[THE present paper was prepared for publication by the later Dr. Dewar not long before his death and has been sent to us by his sister. It is published unaltered, but, as it stands, appears to require a few words of explanation. In this connexion we have had the advantage of discussing the paper fully with Mr. G. C. S. Ingram, whose own studies on the diving of water-fowl in co-operation with Lt.-Col. H. M. Salmon are well known, and his help and advice are gratefully acknowledged.

As the author states below and as students of his work on the diving of birds will be aware, observation shows considerable divergences from the 20-10 seconds rule at depths of less than three feet. The Swan cannot reach bottom in more than about three feet of water, and the correspondences noted are not with the rule in its unqualified form, but with the rule as amended by observation for depths under three feet (the observed timings for sample depths between nine inches and three feet are quoted below). It is evident that Dr. Dewar treated these purely observational amendments for shallow water as constituting an integral part of his rule, but this does not seem to be expressly stated anywhere in his writings and is not immediately obvious to the reader, who is apt to be puzzled on comparing the Swan timings with the figures given by the (unqualified) rule and finding that they do *not* agree. If the situation is expressed by saying that timings of the dipping and tilting of the Swan conform to the observed timings of dives at corresponding depths (*viz.* under three feet) of birds whose deeper dives (up to *c.* twenty-one feet) conform to the rule, the risk of misunderstanding is avoided. — EDS.]

British diving birds, with one exception as far as is known, follow the rule of 20 seconds for the first fathom of depth of water and 10 seconds for every fathom thereafter.

The species are (following Witherby's *Check-List*) Common Pochard, Tufted and Scaup Ducks, Goldeneye, Long-tailed Duck (probably), Common Eider, Common and Velvet Scoters, Goosander, Red-breasted Merganser, Smew; Cormorant and Shag; Great Crested, Slavonian, Red-necked and Little Grebes; Great Northern, Black-and Red-throated Divers; Razorbill, Guillemot (*Uria aalge* subsp.), Little Auk, Southern Puffin. The exception is the Coot which follows a 10-10 seconds rule. The 20-10 seconds rule is approximately correct for all depths from three feet to twenty-one feet. In water less than three feet deep observation differs considerably from expectation under the rule. In soundings of nine inches of water the average period of submersion of the diving bird is 6 seconds, in one-and-a-half feet 10 seconds, in two feet 12 seconds and in two-and-a-half feet 14 seconds, the period in three feet of water being as nearly as possible 15.4 seconds.

Elsewhere (*The Bird as a Diver*, 1924), I suggested the origin of diving from dipping and tilting which are characteristic feeding habits of the surface-feeding Anseres. It therefore seemed worth while to time the periods of submersion of the head in dipping and tilting and to correlate the recorded periods with the depth of water. The Mute Swan (*Cygnus olor*), which feeds chiefly by dipping and tilting and is easily observed, was made the test-subject.

One hundred timings of dipping by Swans averaged 9.3 ± 0.2 seconds: one hundred timings of tilting 13.0 ± 0.2 seconds. These are average times and they should correspond to average depths of water, since the Swan does not all the time feed at the full stretch of the neck. The corresponding depths are one foot four inches, and two feet three inches, according to the rule. The Swan can reach bottom by dipping in two feet or thereby, and by tilting in about three feet of water. In the above series the Swans were not observed to dip in water less than eight inches deep, or tilt in less than one-and-a-half feet of water.

There is also agreement with the rule in the average periods of short series of timings of individual birds feeding in various depths of water.

A Swan dipping to immersion of the eyes or of the whole head averaged 4.7 seconds in six timings. The tip of the bill to the eye measures a little more than five inches, and to the back of the head about eight inches. The expected average period of immersion in seven inches of water is 4.8 seconds.

A Swan dipping in water, ascertained to be two feet three inches deep, averaged 13 seconds in twenty dips. This bird during each dip repeatedly jerked up the hinder end of the body in the effort to reach bottom.

A Swan tilting in water ascertained to be three feet deep, averaged 15.4 seconds in fourteen timings. Another tilting in the same depth of water averaged 15 seconds in seven timings.

The average period of submersion is not governed by the nature of the food-reaction, whether dipping or tilting. A Swan averaged 10 seconds in ten dips: a Swan at its side averaged 10 seconds in ten tilts.

As the young Swan grows up the average periods of immersion by dipping get longer, provided the bird works at, or nearly at, the full extent of its head and neck. The cygnet, of course, does not do this all the time.

TABLE.

Age in Days.	Number of Dips.	Mean Time in Secs.
7	3	1.8
14	10	4.0
28	10	6.1
60	10	7.5
98	10	10.8
140	10	11.9

Water is not essential. In grazing the Swan acts as if dipping in shallow water. A grazing Swan averaged 5.3 seconds in ten consecutive timings. The normal waterline of the bird in the grazing position stands seven or eight inches above the ground, say seven-and-a-half inches as the "depth" for grazing. The expected average period in a depth of seven-and-a-half inches is 5.1 seconds.

The periods of submersion in dipping and tilting by Swans are not irregular and incapable of prediction. Given the depth the average period can be forecast with a fair degree of accuracy. The periods have average values of the same order as those of diving birds. The periods of submersion of the Swan are not determined by the nature of the food-reaction, they are determined by depth of water or by "depth" in air, and are generally equal to those of the diving bird diving in the same depths of water.

OBITUARY.

HARRY BLAMIRE'S BOOTH

(1866-1941)

MR. H. B. BOOTH, who died in his 75th year on September 18th, 1941 at his home at Ben Rhydding, was a native of Bradford and was best known for his intimate knowledge of Yorkshire birds and for the many and generous services he rendered to the Yorkshire Naturalists' Union. In this Union, during the course of years, he occupied every important office. He was instrumental in founding the section for Vertebrate Zoology and was the section's first honorary secretary and later its president, while in 1921 he was elected president of the Union, and at the time of his death was still a member of various committees as well as chairman of that for the Protection of Birds and recorder for Vertebrate Zoology in the West Riding. It was as a most conscientious and careful recorder that probably his most valuable work was done. This for him was no mere routine work, but a task demanding the collection and sifting of evidence and very often involving a journey to make a personal investigation. His reports appeared in *The Naturalist* and he published very little outside that, but that he was always ready to give information about Yorkshire birds and took the greatest pains to ensure its accuracy we can affirm, having frequently sought his aid in connection with work on the *Handbook* and in other directions. His very careful investigations into the status in Yorkshire of the Heron and also that of Great Crested Grebe in connection with the enquiries organized by the British Trust for Ornithology should also be mentioned. Mr. Booth was an old member of the British Ornithologists' Union & Club and a Fellow of the Zoological Society. He also attended several International Ornithological Congresses including the last at Rouen.

As a young man he sailed before the mast to Australia, where he worked for some time in "the bush" and got acquainted with interesting birds. On his return to Bradford he founded his own firm of wool merchants and became a successful man of business. He was for many years chairman of the English Fleece Committee and was an authority on the history of the various breeds of sheep.

He leaves a widow and a son and daughter, and many others in Yorkshire and elsewhere will miss him as a staunch and generous friend.

NOTES

CONTINENTAL JAYS IN KENT.

EARLY in October, 1941, my son, H. F. Ticehurst, who is manager of a farm of about 260 acres in Romney Marsh, informed me that during the last week of September some twenty to thirty Jays appeared on his farm, where none had been seen during the previous year. As a whole, Romney Marsh has of course normally no Jay population at all, as it is devoid of woodland. It so happens, however, that this particular farm is better furnished with trees than the majority, containing three orchards and a number of hedge-row elms and thorns and ditch-side willows. This, with an abundance of food on the wheat, bean and pea stubbles, probably influenced the birds in their choice of winter quarters. About mid-October their number rose to about a hundred, and one shot at that time and sent to me proved to be of the continental race (*Garrulus g. glandarius*). Twenty or thirty were still there at the end of the year, but I cannot hear of any more from elsewhere in the Marsh.

N. F. TICEHURST.

BEARDED TITS IN KENT.

ON December 6th, 1941 when awaiting the evening duck-flight in a Kentish marsh I heard the unmistakable call notes of at least two parties of Bearded Tits (*Panurus biarmicus*). Since that date I have paid the locality further visits for the purpose of getting an idea of the number of the Bearded Tits. These investigations have led to the surprising discovery that they are present in small parties over a considerable area and that there are probably about a hundred birds in all. The evidence points to their having bred there in 1941.

T. C. GREGORY.

SPOTTED FLYCATCHER HATCHING AND REARING BROOD AFTER DISAPPEARANCE OF MATE.

THE following details about a pair of Spotted Flycatchers (*Muscicapa s. striata*), are the result of observations in a garden near Bristol during the summer of 1941, and as similar cases appear to have been seldom recorded these may be of some interest.

After an unsuccessful breeding attempt in June the birds were again building in the first few days of July, and by the 9th or 10th incubation had undoubtedly started. From then onwards the off-duty bird could always be found on some favourite perch nearby. On the 20th, however, it was missing

and from that date no more than one bird was at any time present. Meanwhile incubation continued and an examination of the nest on the 23rd showed that the young (four in number) were just hatched, either on that or the previous day. Subsequently the remaining bird was frequently watched taking food to the nest, and this feeding was carried on with untiring effort until the young were finally reared. They (three of the original four) left the nest on the morning of August 6th. While it cannot be stated with certainty, it may be fairly safe to assume that the remaining bird was in fact the female; and it is perhaps a matter of doubt as to whether the male alone would have continued with incubation and have reared the young.

As a further point of interest it may be added that butterflies—meadow browns and an occasional tortoise-shell—were frequently taken to the nest. Although opportunities were plentiful this bird made no attempt to capture light coloured species such as whites and brimstones. H. H. DAVIS.

AQUATIC WARBLER IN SUSSEX.

ON August 30th, 1941, I watched an Aquatic Warbler (*Acrocephalus paludicola*) for some time climbing about in some dying water-plantains near Pett. I was within about twelve feet of the bird much of the time. It was accompanied by a Sedge-Warbler (*A. schænobæus*), so I could make comparisons and I was using X6 Zeiss glasses. I noticed the following:—Its brighter and more defined colouring, the yellowish eye stripes and very conspicuous crown stripe and the dark stripes on the back. When climbing its streaked rump was also noticeable, but this was less conspicuous in flight. Its note was a kind of "Tchu(ch)". NORMAN W. MOORE.

LESSER KESTREL IN LANCASHIRE.

MR. G. F. Gee has given particulars of a hitherto unrecorded Lesser Kestrel (*Falco n. naumanni*). In 1901 he saw a male bird of this species in the window of a taxidermist, Thomas Picken, of Bridge Street, Manchester and was told by Picken that it had been shot on Chat Moss, near Manchester. It was purchased by a collector in one of the Lancashire towns. Some time later Mr. Gee was told by a taxidermist named Jarvis that he had been employed by Picken at that time and that he had skinned and set up the bird; he also remembered that it had been shot on Chat Moss. Mr. Gee examined the bird and could see that it had been mounted from a freshly skinned bird and not from an old skin, but he did not himself

see it in the flesh. He was, however, confident that his informants were reliable and that the bird had been shot locally. The Lesser Kestrel has not been previously recorded from Lancashire.

A. W. BOYD.

WHITE-TAILED EAGLE IN PEMBROKESHIRE.

THOUGH the White-tailed Eagle (*Haliaeetus albicilla*), was included by M. A. Mathew in his *The Birds of Pembrokeshire* (1894) he was unable to give sufficient evidence of its occurrence in that county on which to base a record. Hence the following note may be of interest.

On June 13th, 1928, Charles Oldham and I visited the farm Goilau Goch near Whitechurch, on the lower slopes of the Precelly mountains in north Pembrokeshire. There Mr. B. Edwards, the son of the farmer, showed us preserved in good condition, an immature White-tailed Eagle which he had shot and killed as it flew low over the farm-yard in 1908 (the exact date he could not remember). Stuffed and mounted in a glass case it had since passed for a Golden Eagle in the district.

BERTRAM LLOYD.

REDSHANK SWIMMING.

ON Sept. 21st, 1941 at high water in the Dee estuary (Cheshire) with the sea perfectly smooth I watched two small flocks of Redshank (*Tringa totanus*), one of 12 and one of 20 birds when first seen. Both were afloat on the water swimming about like gulls, with odd birds rising and flying off whilst others were alighting on the water until there were about fifty in the two flocks. I have of course often seen Redshank swim across streams and pools but never before seen them behave like this in deep water.

W. WILSON.

BAILLON'S CRAKE IN SUSSEX.

I SAW a very small Crake, almost certainly a Baillon's Crake (*Porzana pusilla intermedia*) at Sedlescombe, Sussex in the afternoon of December 27th, 1941, and again on January 5th and 9th, 1942. Each time the bird got up close to me, flew several yards, and then dropped into some rushes. On the first occasion I marked the spot where it dropped, ran quickly to it and got a sight of it as it ran within about a yard of my feet. I noticed its very small size, as compared with my recollection of that of a Spotted Crake (*P. porzana*), which I have seen under similar circumstances, and its long loose looking legs. It was dark coloured all over, except for the white leading edge of the wing (this was seen only on January 5th by me, but was noticed independently

on the same day by another observer, who has no special knowledge of birds). The dark colour was composed of brown-black on the primaries and reddish-brown on the wing-coverts, &c. I had no good view of the under-parts, but what I saw looked blackish. The white leading edge of the wing excludes the possibility of the bird having been a Little Crake (*P. parva*), while its very small size and the red-brown wing-coverts as compared with the greenish-brown of the Spotted Crake (since confirmed by the comparison of skins) seem to indicate that it cannot have been of the latter species.

NORMAN W. MOORE.

WAXWINGS IN GREAT BRITAIN.—Additional to occurrences already notified (*antea*, pp. 157, 180) we have received the following reports:—

ORKNEY (Mainland).—Mr. G. T. Arthur informs us that Waxwings were present from November 4th to 14th. Including those he saw himself and others definitely reported there were over twenty in small parties.

OUTER HEBRIDES.—Mr. Seton Gordon writes that Mr. Finlay Mackenzie had four in his garden at Lochboisdale, S. Uist early in November for three days feeding on *Berberis* berries and that Mr. Compton Mackenzie had one in his garden in Barra at the same time. Waxwings have previously been recorded from the Outer Hebrides only on five occasions.

W. ROSS-SHIRE.—Mr. I. D. Pennie informs us that a Waxwing was seen by a friend in a garden at Aultbea on January 15th, 1942.

ARGYLL.—Mr. Gordon has also been informed by Mr. J. Fraser that he watched two, which stayed two days near Oban in November.

PERTH.—Mr. W. B. Alexander is informed by Mr. H. C. H. Bowser that two were seen early in the year at Doune.

YORKSHIRE.—Mr. W. J. Clarke records (*Nat.*, 1942, p. 38) a considerable number in various places in the Scarborough district. The first recorded were on November 5th. In mid-November a flock varying from 40 to 100 visited some service trees near the Scarborough Museum. All disappeared from the district by January 2nd, 1942.

MIDDLESEX.—Colonel R. Meinertzhagen watched five Waxwings on January 22nd in Kensington Park Gardens, London. The birds were feeding on *Berberis* berries and Col. Meinertzhagen noted that they did not swallow these berries but munched them, leaving considerable debris of husk below the bush.

HAMPSHIRE.—Mr. B. Vesey-FitzGerald informs us that a Waxwing was brought to him in Winchester on February 1st, 1942. It was picked up on a doorstep and was in a very weak state, but after being kept in a room for a day and night and fed on bread it recovered completely and was released.

FIRECREST IN SURREY.—Mr. C. B. Ashby has sent us an account of a Firecrest (*Regulus i. ignicapillus*), which he saw at very close range on Epsom Common on December 25th, 1941. The bird was at some distance from a party of tits and Goldcrests and appeared to be quite alone.

BLACK REDSTART BREEDING IN KENT.—Mr. P. A. Rayfield informs us that on June 9th, 1941 he saw a male Black Redstart (*Phœnicurus o. gibraltariensis*) perched on a wire and singing and then flying down among some wooden crates. A few days later he saw a recently fledged young one at this spot. He saw no hen bird and the male was not in fully mature plumage, but on September 5th the bird had moulted into winter plumage and had then the white wing-patches of maturity. More than a mile from this site Mr. Rayfield watched another male singing on May 11th and 15th, 1941. It is therefore evident that at least one pair bred in the locality in the Medway area in which Mr. Rayfield described the breeding of two pairs in 1940 (*antea*, Vol. xxxiv, p. 186).

COMMON EIDER IN CHESHIRE.—Mr. W. Wilson informs us that an Eider (*Somateria m. mollissima*) first seen on December 7th, 1941 was still present in the middle of January, 1942 at Hilbre Pool (Dee). It was at the same spot that he watched a flock in November, 1939 (*antea*, Vol. xxxiii, p. 228).

OYSTER-CATCHER IN SURREY.—Capt. H. Foster informs us that on January 25th, 1942, he and Capt. Holden saw an Oyster-catcher (*Hæmatopus ostralegus*) on the frozen lake at Wimbledon Park. When disturbed the bird flew to the adjoining golf course and on being approached again flew back to the ice.

GLAUCOUS GULLS IN SCOTLAND AND ENGLAND.—In connection with the unusual number of Glaucous Gulls (*Larus hyperboreus*) already reported (*antea*, pp. 182-3) Mr. G. T. Arthur informs us that in Orkney Mainland there have been about four times the usual number of these gulls. They arrived early in October and were still present in January. He writes of seeing about forty in one afternoon round the western part of the island where in a normal year he would have seen ten or so. We have also been informed of the following occurrences of single immature birds: Chatham Reach (Kent), December 5th, 1941 (P. A. Rayfield), Blackwater (Essex), December 7th (T. Bispham), N. Skye, January 4th, 1942 (Seton Gordon), Hammersmith Bridge, January 15th (W. R. Philipson) and Gairloch (W. Ross) January 27th (I. D. Pennie).

ICELAND GULL IN KENT.—Mr. P. A. Rayfield gives us details of an immature Iceland Gull (*Larus glaucoides*) seen by him in Chatham Reach (Kent) on March 22nd, 1941.

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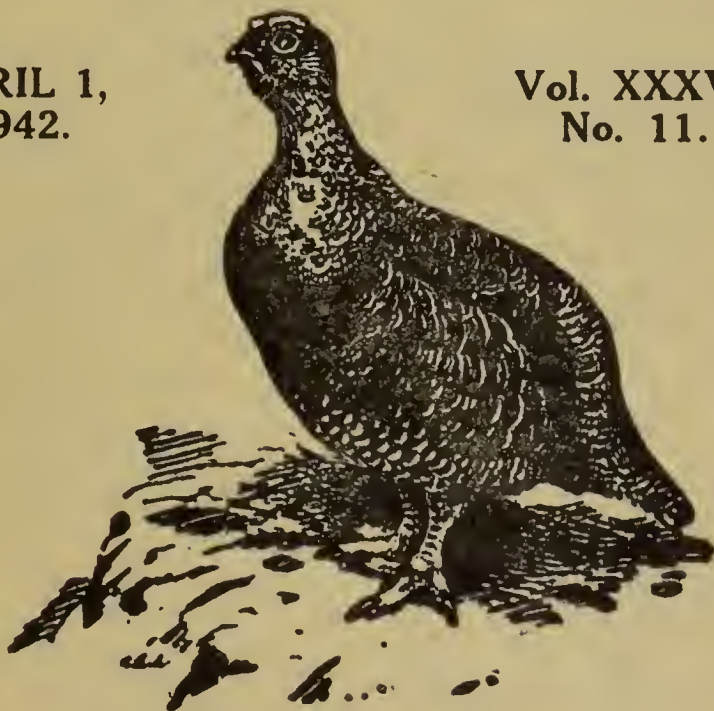
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NOTES ON THE SOCIAL BEHAVIOUR OF BLUE TITS

BY

M. K. COLQUHOUN.

CIRCUMSTANCES made it impossible to complete the following study on the Blue Tit (*Parus c. obscurus*), but as little is known about even the pair formation of this species, and as work on social dominance has too often been confined to birds in captivity, it is felt that these notes are worth publishing, although unfinished. They are derived from observations on over seventy colour-ringed birds, among which six pairs were known to have bred successfully during 1938 or 1939. The trapping was done in a garden at Lambourn Woodlands, on the Berkshire downs. Feeding hoppers were provided so that the relationship between individuals could be watched; otherwise the population was not interfered with. Some five hundred contacts between individuals were recorded, most of them in December or February.

PAIR FORMATION

Most of the birds which subsequently bred had arrived in the locality by the end of November. In winter, it is difficult to tell whether a bird is paired or not: the most certain way is to watch the roost. Paired Blue Tits do not roost communally, but they often roost close to each other, while they indulge in a "good-night" display which probably has considerable social significance in maintaining the relationship. This display is not performed daily, but it occurs throughout November and December, and also in early spring.

The female nearly always goes to roost before the male. The roosting of a pair has three separate aspects of behaviour, which do not necessarily all operate together; (a) a mutual roosting flight, (b) a visit to the female's roosting hole, apparently to confirm that she has gone to roost, (c) the male roosting close to the female. The evening flight is not easy to observe, but is frequent; it takes place between a perch near the roosting hole and a more distant one. Often it is a chase, often it is a game. The female is silent, but the male may sing several times when he perches by her roost; he is always solicitous of her on these occasions, giving an alarm note on the slightest approach of danger. If she has gone to roost by the time he arrives he may call her out and together they indulge in a chase, or perch near the roosting hole. When she finally enters he accompanies her to it, staying on a perch for two or three minutes, during which he preens himself or sings. If there has been no flight,

or none visible to an observer at the roost, and she has already entered when he arrives, he flies to the entrance, clings there a moment only, and is gone, although sometimes he may linger on a perch for a minute or two. It is rare to find him arriving before she has gone to roost; if he does he is gone in a flash, to return later. At times he enters the hole himself, but never stays long.

The three pairs whose roosting was studied nested in boxes; of these, two females built where they had previously roosted, the third taking possession of the box where her mate had been. But previous to nesting the female has ceased to use the site for roosting at night. When she no longer uses it as a roost she apparently inspects the hole early in the morning—much the same time, in fact, that she would normally emerge.*

The roosting flights have added significance when it is remembered that flight is an essential part of Blue Tit display. One such performance was particularly interesting to watch as it occurred outside the previous year's nesting hole, the male having retained the same territory. The female was a new one, that is, she was first trapped in the previous November. Early on March 3rd the male drove off an unringed Blue Tit from the nesting tree, while the female stayed near the entrance of the hole. On April 5th the male drove off a Marsh-Tit (*Parus p. dresseri*), even following it to a neighbouring tree and chasing it away, while again the female remained inactive by the hole which had been used by her predecessor. A fortnight later I was watching when she began fluttering her wings near the entrance; the male, who was feeding quite close, immediately began vibrating his wings and approached. As she had moved to another branch his pause outside the nesting hole suggested that it was a partner in the display. She did not enter, and he flew to another branch with the typical dipping insect-like flight; both fluttered their wings for a moment, and resumed feeding. When a Marsh-Tit nervously examined the hole half an hour later it was not molested. The Blue Tits successfully reared a brood in this nesting hole.

Another pair began wing fluttering and mutual twittering, which rose to a crescendo as they fluttered round the trunk and landed together on a thick branch. Her vent was clearly visible as he dismounted, and coition was followed by violent wing fluttering and a deliberate pecking at each others' bodies and bills. Wing fluttering was continued afterwards, but the whole after-display was so brief that they had resumed feeding within ten seconds of the mating. In a minute or two the male sang for the first time.

*One of the boxes was fitted with a trigger which completed an electric circuit, and so rang a bell each time the hole was entered or left.

The Blue Tit is a relatively infrequent singer. Early in May I had occasion to spend the whole day near this pair's nesting box. In that part of his territory the male only sang twice during the day.

There were no records of the male helping to clean out a box before nesting. Both male and female, however, remove excrement from the young, and when the latter take their first flight they are immediately fed by one or other of the parents.

In the summer months it is difficult to observe ringed tits, but I have seen a pair which has successfully reared its brood still together in August—for example, visiting a feeding hopper together, no other tits having been there all morning.

DOMINANCE

Dominance is so dependent on the territorial position at the moment of reaction and on the endocrine balance of the individual that even inter-specific variations occur. Thus, although in Nuthatch-Titmouse flocks it is usual for Nuthatches (*Sitta e. affinis*) to dominate Great Tits (*Parus m. newtoni*), Great Tits to dominate Blue Tits, Blue Tits to dominate Marsh-Tits, and so on, a Blue Tit which is not necessarily dominant to all the other Blue Tits may threaten a Great Tit so determinedly as to drive it away from a feeding hopper. One Blue Tit which eluded the trap drove off every species of tit with extraordinary truculence, but was itself dominated by the male holding the territory. But this is unusual; inter-specific dominance is normally recognised by all members of the flock. The most likely factor to upset it is the near proximity of a nest or roost. Of course, should aggressiveness in the dominant species be in abeyance both birds will feed together providing they are not in each others' way.

Relative to its size the Blue Tit is one of the most aggressive of birds. As it crouches to threaten another, with flattened body and bill either pointing straight at its rival or slightly lowered, not only its crest but every feather seems to stand on end—a tiny atom bristling with venom. This is usually enough for the other and it is gone in a flash. The movement is extraordinary quick; a Blue Tit seems to recognise an individual before we can determine the species. So that if A is feeding at a hopper when B is approaching it has either gone before I have had time to confirm that B is a Blue Tit, never mind thinking of its position in the social hierarchy; or else A goes on unconcernedly feeding, while B flutters to the roof of the hopper and awaits its turn. It may be, of course, that rather than recognising the individual A distinguishes between degrees of dominance or confidence in B's

approach, But few who have watched Blue Tits intensively can doubt that they do recognise individuals. Often the dominant feeding bird pauses in its feeding to look at its subordinate, who either flies away at once or else becomes visibly uncomfortable, with a pretence of pecking at something before it edges away.

Because of the quickness of their movements a standing threat is more rare than an approach threat, such as occurs when B darts up to A. Here, A goes before B alights. If the relative dominance is high, B may follow up and chase A out of a neighbouring tree, even for a hundred yards. If the relative dominance is low, A and B may feed side by side. During the winter months it is common to see three or four tits feeding at the same hopper ; it seems that most of these are either temporary visitors or else regular visitors from a distant territory. At any moment a dominant tit may come up and drive off one or all. If it is hungry, as it often is in cold weather, such a despot will threaten by fluttering its wings as it feeds, only threatening with its bill should another fail to be warned and approach too close.

Occasionally an attacking tit may fail in its purpose and be itself driven off, or the threatened tit stands fast, so that both fall into the standing threat position, remaining motionless until one gives way, or, more rarely, until both give way and resume their feeding. I once witnessed a duel in which one tit finally gave way, and was able to record several subsequent contacts in which the bird who had been dominated made no further effort to resist, and always fled at the approach of the other. It must be emphasised that all Blue Tit combat is psychological, and not physical.

Sometimes there occurs a tit very low in the social hierarchy which hangs about on the outskirts, too nervous to feed with any others ; so pronounced is this nervousness that every passing tit will threaten it. At the other end of the dominance scale, a male visiting a neighbouring territory in December was far more aggressive than either of the pair holding the territory in which he fed, although they—and they alone—could both dominate him ; yet in the early spring, while still dominating all Blue Tits except the owning pair, his aggressiveness had declined to normal. His subsequent mate was high in the social hierarchy throughout December, suggesting that they were already mated at that time; if this was so, his abnormal aggressiveness is likely to have been due to individual variation in the activity of gonads or pituitary.

The seasonable variation in this male's aggressiveness was a reversal to that occurring generally in the flock. A definite

decline in aggressiveness towards the end of the calendar year was shown by the number of neutral contacts recorded. When two tits were seen feeding within three inches of each other without any signs of enmity or dominance, their identity marks were entered in the records and united by a plus sign (+); this is called a neutral contact. It is interesting to compare the total number of neutral contacts witnessed at one feeding hopper during the first three weeks of December with those for the first three weeks of February in the following year:

		December			February		
Week ending (1938-9) ...	...	7	14	21	7	14	21
No. of neutral contracts ...	...	0	2	20	6	3	1
Per cent. of total contacts ...	...	0	8	23	7	3	2

All the contacts of the male mentioned above were either positive or negative, that is, he either dominated another or was subordinate to it. The degree of dominance can be measured by observing whether the despot (*a*) is dominant to another but does not drive it off; (*b*) drives it off; (*c*) chases it. There is some evidence to suggest that females are involved in more neutral contacts than males.

Reversed contacts (the normal despot being subordinate) do occur, but are so infrequent that the relative domination of two tits can be determined after witnessing three contacts between them. To observe even this number in a wild population may call for patient and intensive watching.

It was interesting to observe that a tit which had been driven off by a Great Tit, or dominated by another Blue Tit higher in the social order, or which had attempted and failed to drive off another, not infrequently would immediately turn on one or more tits who were its social inferiors and threaten them, while a tit low in the social hierarchy has been seen to show extreme viciousness when it chanced on a tit that it could dominate. These findings are in agreement with previous work on the psychology of dominance in bird or man.

Observations at the same feeding hopper during the winter 1938-39 showed that the following five Blue Tits headed the social hierarchy, in the order shown. The "dominance ratio" is the total number of positive contacts divided by the total number of negative contacts.

Mark	Sex	Total number of contacts recorded	Dominance ratio	Distance to territory
G/Y	♂	59	52.0	owners
GG/-	♀	32	19.0	
RY/-	♂	33	29.0	15 yards
YY/-	♂	52	4.2	c 60 "
B/Y?	♂	40	4.4	50-100 "

In calculating the ratios of G/Y and GG/- all intra-pair dominance has been omitted, as it lowers the ratio for comparison with other individuals. For some reason, which may not have been coincidence (for example, rivalry may have been too intense to permit of ordinary contacts), no contacts were ever seen between RY/- and the owners of the territory; consequently no tit ever opposed him, and his ratio remains abnormally high. He lost his mate, and remated in late February. YY/-'s mate ranked about eighth, with a ratio of 1.7, the remaining birds recorded being less than 1.0. The boundary of B/Y's territory remained unknown, a small field intervening.

The social order of these males at that place was definite and did not change through the winter. They could drive off every Blue Tit in the flock except those immediately above them, and the female GG/-. They roosted in their territories, and bred in them in the following spring.

G/Y was usually dominant over GG/- through the winter, with variations in degree: in early February, however, she definitely became the despot for a few consecutive days, this period being followed by a few neutral contacts before he resumed dominancy. This was known to be her second season in that territory, and she was an amiable despot, driving off every Blue Tit, including the only one of her own brood to return in the winter. Intra-pair dominance is a subject which should repay further study, especially in a species where the degree of dominance can be recorded.

As always in studies on dominance interesting variations occur. For example, a female Blue Tit threatened a Coal-Tit (*Parus a. britannicus*), whereupon the latter turned on the Blue Tit's mate, an aggressive bird high in the social order, and drove him out of the tree. It would seem that the need for self assertion in a thwarted bird can occasionally rough ride that bird's own inferiority.

FLOCK FORMATION.

The demands of reproduction necessarily restrict movement, so that a territory is not often left, except during incubation, when the male has leisure to wander into surrounding areas. But when breeding is over flocking occurs, territories are invaded and, superficially, have ceased to exist. That they still can exist is revealed by the social order at any one point, and by the fact that pairs roost in them.

A winter flock is always on the move, but as the movement is only local it may be assumed that it, too, has a territory. When hourly observations are being made in one place it is

found that tits arrive in waves, a period of great activity being followed by an absence of tit life. Although individuals and the time of their visits were recorded there was no evidence that more than one flock visited the food, or that the flock was sub-divided into sections. But the composition of the flock is extremely mobile, as it is constantly shedding individuals and taking on new ones. This means that many birds have to be trapped and ringed which cannot be observed, and that trapping must continue throughout the winter. Apart from these restless nomads attaching themselves to a flock whose nucleus may be the holders of territory within the flock's territory, there was a much heavier change in the population beginning about the end of 1938. Within a month, apart from a few residents, the ringed flock had become an unringed one and the work of ringing had to begin all over again. Kenrick (1940) seems to suggest that there are no visitors until January; he estimates the residents as three eighths of the population. Maynard (1936) found unringed birds arriving in batches at about five day cycles, and this tendency is confirmed by the present data. Winter flocks of Chickadees (*Parus (Penthestes) atricapillus*) are reported to have a territory (Wallace, 1941), with individuals rarely cruising as much as half-a-mile.

Two broods were seen flocking together in mid-June—a fortnight after fledging. As only one brood was ringed it was interesting to see that they did not mingle, although in one flock. The oldest brood was in the van.

SUMMARY.

Part of the Blue Tit population is paired throughout the year, the tie between the pair being stimulated in winter by mutual display before going to roost. A flock consists of a small nucleus of residents and constantly drifting nomads. A clear social hierarchy exists within the flock in winter; residents are dominant to nomads and the social order of the residents is related to territory. Dominance is subject to seasonal variation, and intra-pair dominance may suffer reversal.

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EGG-SHELL DISPOSAL BY BIRDS

BY

CAROLINE AND DESMOND NETHERSOLE-THOMPSON.

*(Continued from page 223).*BLACK-THROATED DIVER (*Colymbus a. arcticus*).

Shell fragments noted in nests, but in one case large portion dropped clear and later apparently removed.

RED-THROATED DIVER (*Colymbus stellatus*).

Large fragments remain in nest (G. Arthur). Female removed broken egg into middle of tarn where she and male broke it into small pieces, biting and shaking it about (D. B. Keith, *Brit. B.*, xxxi, p. 75).

WOOD-PIGEON (*Columba p. palumbus*).

Both sexes remove shells (J. H. Owen). Egg-shells frequently dropped below nest, but sometimes carried away (D.N-T.) Shells often found below nests (R. Ware and J. Markham). Shells frequently carried right away (W. Marshall). One seen to fly with and drop an egg-shell (Miss Buxton, *Zool.*, 1902, p. 86).

STOCK-DOVE (*Columba ænas*).

Shells not found below nest, but quite large pieces found in and just outside nest in rabbit-hole (D.N-T.). Large portion found on ground in wood, so carrying evidently occurs (T. L. Patey). Shells may be ejected under nest-hole (O. R. Owen).

ROCK-DOVE (*Columba l. livia*).

Some shell remains noted in one nest. Large fragment also noticed almost below nest in cave, but, in some cases, active disposal definitely occurs.

TURTLE-DOVE (*Streptopelia t. turtur*).

Egg-shells found under nests, but sometimes away from them, having evidently been carried away by sitter.

COMMON CURLEW (*Numenius a. arquata*).

Reaction variable. Many observers, including ourselves, have known all shells to be left after young have departed, but this only sometimes occurs. In observations in detail on a number of pairs the following notes have been made by C. and D.N-T. Female may drop large shell-portions just outside nest or walk with and drop them in water, afterwards, perhaps, rinsing out bill. She may also walk off and then fly away with shell to distance of 50 to 400 yards. Reaction may weaken after removal of one or two shells, and some birds are less ready to move them than others. Small pieces may be similarly treated or left in nests, nearly all of which contain a varying quantity of shell débris. Removal of shells to a distance also noted by John Markham, G. Tomkinson, and O. R. Owen.

Miss Frances Pitt tells us, however, that a Curlew she was watching never removed any shells, "and when the empty

shells fell out of the nest she carefully raked them in again and pushed them beneath her. When she vacated the nest the crushed shells were left in it." Addled eggs are not ejected.

WHIMBREL (*Numenius ph. phaeopus*).

Three shells removed, but fourth still in nest when observations ceased (R. Chislett). A considerable quantity of shell noted in a nest containing two small young (A. H. Daukes, *Brit. B.*, xxv, p. 65).

WOODCOCK (*Scolopax rusticola*).

Disposal methods studied in detail by C. and D.N-T. Shells normally allowed to remain, but at a nest studied in 1939 female lifted and dropped one shell on edge of nest and later removed it. We also obtained evidence of carrying in 1937. Small pieces may be ignored, scattered round nest, or buried in lining. O. Steinfatt (*Journ. f. Ornith.*, 1938, p. 415) noticed that when newly hatched young did not follow female she removed shells from cup to edge of nest and brooded young, but after young had left she replaced shells. Addled egg not ejected, and in one case damaged egg did not cause desertion (C. and D.N-T). Shells left in nest, but on one occasion placed on side of it (D. Stubbert). Some pieces buried in lining (N. Tracy).

Hen flew direct from nest with shells and apparently returned without landing. Small and large pieces removed. One small fragment only crushed into nest (E. J. Hosking).

COMMON SNIPE (*Capella g. gallinago*).

In most cases all egg-shells are allowed to remain in nest or are dropped just outside it. In one case, however, shell was found in open as if carried away (C. and D.N-T.). Many observers have noticed non-removal of shells, but F. M. Ogilvie in *Field Observations* watched a nest from which shells were removed as each chick hatched. Addled eggs are not ejected. Non-removal of shells has also been noted in *Capella g. færoensis* by G. Arthur and D.N-T.

RED-NECKED PHALAROPE (*Phalaropus lobatus*).

Large piece of shell carried away by cock (J. S. Douglas). All shells removed but disposal not actually observed (R. Chislett).

SOUTHERN DUNLIN (*Calidris alpina schinzii*).

Earlier hatched shells may be carried away whereas those hatched later allowed to remain, or all carried away. Some small pieces crumbled into lining (C. and D.N-T.) A number of used egg-shells picked up (E. B. Dunlop and D. Stubbert).

COMMON SANDPIPER (*Tringa h. hypoleucos*).

Large shell-portions sometimes definitely carried away by female. In one case, however, a shell was "teased" and partly eaten after being carried fifty yards. Small fragments may be broken up and eaten, carried away, or both. Only minute shell-pieces noted in nest after young had



GREENSHANK : Hen removing egg-shell, which was dropped in flight. (*Photographed by E. J. Hosking.*)

gone. Addled eggs noted in empty scrapes (C. and D.N-T). In one case when two young were hatched the pointed ends of unhatched eggs were wedged into large halves of hatched shells (F. C. R. Jourdain). Sitter pecked one of the shells hard several times, then carried it in beak about 30 yards and dropped it in river (O. R. Owen).

WOOD-SANDPIPER (*Tringa glareola*).

Adult seen flying away with shell in bill. Only quite small shell-pieces unejected (H. Kirchner).

GREEN SANDPIPER (*Tringa ochropus*).

Halves of shells left in nest (W. Grossmann, *Journ. f. Ornith.*, 1918, p. 291). All four shells, still wet inside, found in nest. Chicks at foot of nesting-tree (H. W. Wheelwright quoted in *Life Histories of N. American Shore Birds*, ii, p. 19.)

BRITISH REDSHANK (*Tringa totanus britannica*).

Studied in detail by C. and D.N-T. Shells normally carried away by sitter to variable distance—*c.* 40 to over 100 yards—from nests, but reaction may weaken towards end of hatch. Shells may then be left in, or dropped just outside, nest, and they are occasionally dropped in water. Brooding of empty shells may continue for variable periods, but they may be carried away in the order in which they hatch. Small pieces often left and crumbled up by body action in course of incubation, but, if of a certain size, these also may be removed. In one case membrane adhering to chick was eaten. Addled eggs unejected. Female on one occasion definitely identified as shell-remover.

GREENSHANK (*Tringa nebularia*).

Shell-disposal practices studied in detail by C. and D.N-T., whose observations have been supplemented by a valuable series of notes and photographs by E. Hosking and J. Markham who were collaborating with them in 1940. (For published references see R. Chislett in *Northward Ho for Birds*, pp. 52-3 and C. and D.N-T. in "Greenshank Saga" in *The Field*, 1940, pp. 760-61). Practically every known practice observed (see Introduction to this paper). Addled eggs not ejected.

RINGED PLOVER (*Charadrius h. hiaticula*).

Shortly after each egg has hatched, sitting bird—cock or hen—flies away with shell. Small pieces similarly treated or allowed to remain in nest-hollow. Addled eggs not ejected (D.N-T.). Shells occasionally blown away by wind (T. Hepburn, *Zool.*, 1904, p. 170).

LITTLE RINGED PLOVER (*Charadrius dubius curonicus*).

Sitting bird flew away with egg-shell (E. Pedler and R. C. Ledlie, *Brit. B.*, xxxii, p. 97). Shells removed as soon as young hatch and in several cases carried over 100 yards (Ziemer *in litt.* to J. v. Wangelin, "Neuer Naumann," viii, p. 74).

KENTISH PLOVER (*Leucopoliuss a. alexandrinus*).

Egg-shells removed by sitter (J. Tart).

SOUTHERN GOLDEN PLOVER (*Pluvialis a. apricaria*).

Disposal methods studied in detail by C. and D.N-T. Either sex, the cock in particular, removes large and small portions of shell from nest. Disposal-flights covering distance of c.50 to 300 yards, and shells normally dropped in flight, or occasionally after landing. In one case bird flew away, turned and flew almost back to nest before dropping shell. Small fragments are sometimes allowed to remain in nest and are then broken up in lining. Bill-rinsing noted, shells may be brooded for a considerable period, but reactions of individual birds very variable. Addled eggs, and in one case dead chick, not ejected. Cock photographed by E. Hosking, in act of removing shell. DOTTEREL (*Eudromias morinellus*).

Studied in detail by C. and D.N-T., whose observations are supplemented by photographs and notes made by J. Markham at one of 1940 nests. Cock normally flies away with large portions of shell after pushing or ejecting them on to nest-edge. Shells may be dropped in flight at distance of c.20 to 200 yards from nest or bird lands and "teases" shell, nibbling or, possibly, eating some of it. Bill-swilling once observed. Small pieces carried away, one by one, buried in lining or eaten. Very minute pieces only allowed to remain. At hatching first egg at one of our 1940 nests John Markham watched cock roll shell three inches from nest, but this was not removed until 100 minutes later. Cock then away 20 seconds; on his return he ran off with smaller piece of shell stopped 20 yards away, pecked at and possibly nibbled it, and returned to nest two minutes later. Cock, after brooding chick for short period, removed shells one by one, flying 25-30 yards, dropping them, and immediately returning (S. Gordon). LAPWING (*Vanellus vanellus*).

Hen definitely flies away with large shell-fragments carrying them up to 200 yards from nest, but often less than 100 yards. Small pieces broken up and apparently deliberately buried under lining. It is thus normally possible to tell whether clutch has or has not hatched (C. and D.N-T.). Lapwing seen running with egg-shell in bill to distance of 30-40 yards from nest (G. Charteris). Hen photographed with shell in bill prior to removal (E. Hosking).

AVOCET (*Recurvirostra avosetta*).

Shells removed from nest immediately young hatched. Generally taken in bill to nearest water and dropped. Even casual pieces are thus carried away, but shells may be dropped in the colony some distance from nest. Sometimes at the water-side shell is nibbled. Egg-shells are also removed by birds when

sitting if noticed at a distance and also when a shell is noticed in the midst of a colony (G. F. Makkink, *Ardea*, 1936 p. 53).

BRITISH OYSTER-CATCHER (*Hæmatopus ostralegus occidentalis*).

Shell-disposal reactions studied in detail by John Markham and D.N-T. Large fragments normally carried away by female, who usually walks off and then takes flight, carrying eggs any distance up to c.400 yards. Later hatched shells may, however, be left, and brooding of empty shells has been proved by both observers. J. Markham watched hen drop shell into pool of water and D.N-T. noticed bill-swilling following shell-disposal. Small pieces of shell may either be ignored or broken up and eaten (J. Markham). Definite proof that damaged egg may be eaten or removed. Addled egg not ejected (D.N-T.). Hen dropped shell in pool and ate membrane (S. Gordon).

STONE-CURLEW (*Burhinus æ. ædicnemus*).

Little trace of shell noted in a couple of nests containing young (D.N-T.). "Cock Stone-Curlew came up to hen brooding chick and egg and just before he came she rose and and I could see wriggling of wet down—hatching of second egg—and the cock picked up the larger portion of shell and ran off with it" (R. Chislett *in litt.*). Behaviour of another pair studied and photographed by E. Hosking, who noticed that cock wrenched the top off both shells. Holding one of these in bill he continued to sit for nearly quarter of an hour. Later he deliberately stamped upon, crushed, and consumed fragments of both large and small portions. Hen also similarly walked away with, broke, and ate other large fragments (*Country Life*, 16.1.37. pp. 68-69.).

SANDWICH TERN (*Sterna s. sandvicensis*).

Shells invariably remain in the vicinity of nest (E. B. Dunlop). Reaction variable, but shells may be removed. Addled eggs unejected. This bird also regularly defecates close to and around nest. (D.N-T.)

ROSEATE TERN (*Sterna d. dougallii*).

Shells removed. Large piece picked up away from colony, but no direct observation.

COMMON TERN (*Sterna h. hirundo*).

Large portions of shell normally removed, but reaction varies. Addled eggs not ejected (D.N-T.). Shell immediately removed by female on hatching. (G. and A. Marples, *Sea Terns*, p. 147, pl. 46). Small fragments may be eaten (G. Marples).

ARCTIC TERN (*Sterna macrura*).

Shells carried away by sitting bird (G. Arthur). Scarcely had second egg of c/3 hatched before parent took up shell in bill and flew away to distance, soon returning with small fish (E. Schumacher, *Unter Säbelschnablern u. Seeschwalben*, p. 36).



LAPWING: female with shell in bill prior to removal.
(*Photographed by E. Hosking*).

Female also photographed in act of removing shell. (W. Bickerton, *The Baby Bird and its Problems*, p. 109).

LITTLE TERN (*Sterna a. albifrons*).

Large portions of shell removed by sitting bird (D.N-T.). Observation confirmed by G. Marples, O. Grabham and E. B. Dunlop.

BLACK-HEADED GULL (*Larus r. ridibundus*).

Large shell-fragments may be ejected or carried away. Smaller pieces (and in some cases large pieces) found in lining or just outside nest. (D.N-T.). Damaged egg sucked if hole of sufficient size (F. B. Kirkman).

COMMON GULL (*Larus c. canus*).

Large portions of shell carried away, but some pieces not ejected (G. Arthur and D.N-T.). Large portions moved to short distance (E. B. Dunlop).

HERRING-GULL (*Larus a. argentatus*).

Reaction evidently variable. Bird (sex?) once seen carrying shell in bill, but shells also noted in nest, and on ledge or gully (D.N-T.). Shells removed (J. Markham). Many shells remain in nests (E. B. Dunlop). Shells usually eaten (R. M. Lockley).

BRITISH LESSER BLACK-BACKED GULL (*Larus fuscus graellsii*).

Reaction variable. Sitting bird may remove and fly off with shell during hatch, but reaction varies as many shells found in or close to nest (D.N-T.). Shells normally eaten (R. M. Lockley).

GREAT BLACK-BACKED GULL (*Larus marinus*).

Reaction variable. Large portions of shell may be removed and in some cases may be eaten (G. Arthur and D.N-T.). Shells removed to short distance or allowed to remain in nest (E. B. Dunlop and T. A. Coward). Shells usually eaten (R. M. Lockley).

KITTIWAKE (*Rissa t. tridactyla*).

Large portions of shell found away from colony. Carrying obviously occurs in some cases (John Markham). Shells either carried away or ejected over cliff (G. Arthur).

GREAT SKUA (*Stercorarius s. skua*).

Large portions of shell removed (G. Arthur). Some shell fragments allowed to remain in or near nest (R. Chislett, *Northward Ho for Birds*, p. 82). Body of hatched shells close to nests (E. B. Dunlop). Half of hatched egg-shell photographed within a few inches of nest containing 1 young and an hatched egg (O. A. J. Lee, *Br. Birds in Their Nesting Haunts*).

ARCTIC SKUA (*Stercorarius parasiticus*).

Shells removed but no evidence as to share of sexes (D.N-T.). Shells carried away (G. Arthur). Photographed with shell in bill prior to flying away and dropping at a distance (I. M. Thomson, *Birds from a Hide.*).

BRITISH RAZORBILL (*Alca torda britannica*).

Shell remains found under nesting-place. Ejection occurs

(C. V. Stoney and G. Arthur.). In five cases shell of hatched egg lying beside chick, but some had disappeared. Some shells may be accidentally knocked over ledge, but as shell may disappear from nest in hole, ejection probable. Some small pieces also allowed to remain (E. B. Dunlop).

NORTHERN GUILLEMOT (*Uria a. aalge*).

Large fragments ejected (G. Arthur). Shells found below and on nesting ledges. Large pieces of membrane also noted (E. B. Dunlop).

SOUTHERN GUILLEMOT (*Uria a. albionis*).

Shells found on and below ledges (C. V. Stoney and E. B. Dunlop). In letter to E. B. Dunlop from T. H. Nelson, latter says that Bempton "Climmers" say that birds knock shells off ledges or remove them by bill dropping them over rocks or water.

BLACK GUILLEMOT (*Uria g. grylle*).

Shells left in hole and trampled down (G. Arthur). Confirmed by E. B. Dunlop in observation of many cases. In one other case, however, shells were noted just outside hole. Membrane, addled eggs and dead chicks likewise unejected.

SOUTHERN PUFFIN (*Fratercula arctica grabæ*).

Some shell fragments found in burrow from which young had gone (D.N-T). Large fragments of shell left in hole and trampled down (G. Arthur). In three cases shells inside holes with newly-hatched young; later in season, in another area, several noted outside burrows (E. B. Dunlop.).

CORN-CRAKE (*Crex crex*).

Some egg-shells found in nest after young had left (G. Arthur and D.N-T.) Pile of egg-shells left in nest (R. H. Brown, MS.), but in another case (*Brit B.*, xix, p. 67) R. H. Brown noticed that when 7 out of 14 eggs were hatched shells of 4 were lying beside the nest at 6 a.m., but by noon all shells had disappeared although two infertile eggs still remained in it.

SPOTTED CRAKE (*Porzana porzana*).

Shells removed by parents during hatching (Ziemer *in litt.* to J. v. Wangelin, "Neuer Naumann" viii. pp. 74-5).

WATER-RAIL (*Rallus a. aquaticus*).

Some shells found in nest after hatching (D.N-T.). Some shells ejected from nest although large quantity of shell débris often found in it after young have gone (J. Vincent). Parent removed the shells in its bill and scrunched them up just outside the nest, apparently eating most of the shell (A. Buxton, *Trans. Norfolk and Norwich Nat. Soc.*, 1935, p. 91.). Female may remove chicks and unhatched eggs (E. L. Turner) but this is attributed by J. Vincent to disturbance due to photography. Cock removed shells during hatch, walked away and dropped

them in thick sedge. In one case hen lifted and passed egg-shell to cock (E. Hosking).

MOORHEN (*Gallinula c. chloropus*).

Egg-shells found in and below nests, but J. Markham has actually watched female pick up shell and drop it over edge. Removal of all shells may also take place after all young have hatched (C. V. Stoney). Addled eggs not ejected (D.N-T.). Shells often removed a short distance (J. H. Owen).

COOT (*Fulica a. atra*).

Some egg-shells left in nest, but J. Markham has watched sitting-bird lift and eject them over nest edge. Shells often removed a short distance (J. H. Owen).

CAPERCAILLIE (*Tetrao u. urogallus*).

Egg-shells normally allowed to remain in nest, but female occasionally picks one up and drops it just outside. Large shell portions twice found well away from nest, but no proof as to method by which they were removed. Small pieces may or may not be placed inside larger portions. Unhatched eggs unejected.

BRITISH BLACK GROUSE (*Lyrurus tetrix britannicus*).

Shell disposal same as with Capercaillie. Small pieces may or may not be placed inside large ones. Unhatched eggs not ejected.

BRITISH RED GROUSE (*Lagopus s. scoticus*).

Egg-shells not removed, but female sometimes definitely places smaller portions inside larger ones and we have proved by experiment that she will rake in and continue to brood larger shell portions which have rolled out of nest during hatch. In one case damaged egg removed by female who carried it off in her bill. Unhatched eggs not ejected.

IRISH RED GROUSE (*Lagopus scoticus hibernicus*).

Disposal behaviour basically same as with *Lagopus s. scoticus*.

SCOTTISH PTARMIGAN (*Lagopus mutus millaisi*).

All egg-shells left in or on edge of nest. Small pieces sometimes placed inside larger ones. Female rakes in and continues to brood hatched shells. Unhatched eggs not removed.

PHEASANT (*Phasianus colchicus*).

Egg-shells not removed, but small half sometimes placed inside larger. Unhatched eggs not removed.

COMMON PARTRIDGE (*Perdix p. perdix*).

Egg-shells not removed, but E. Hosking photographed female placing small portions inside larger ones and apparently helping chicks out of shells. C. V. Stoney, however, has found large shell portions 30 yards from a hatching brood and suggests that active disposal occasionally occurs. Unhatched eggs not ejected (D.N-T.).

RED-LEGGED PARTRIDGE (*Alectoris r. rufa*).

Egg-shells not ejected from nest.

NOTES

UNUSUAL BIRDS IN MONMOUTHSHIRE.

In their paper on *The Birds of Monmouthshire* (Trans. Cardiff Nat. Soc., lxx, 1937) G. C. S. Ingram and H. M. Salmon do not include the Willow-Tit, give only two records of the Firecrest and state that the Buzzard is now a doubtful resident. The following notes may therefore be worth putting on record.

WILLOW-TIT (*Parus a. kleinschmidtii*). On January 11th, 1942, a day of brilliant sunshine, I had under close observation for over 20 minutes, in the village of Llandegveth, near Caerleon, Monmouthshire, a pair of Tits of this species. I based my identification on their dull, brown black crowns, which showed no sheen in the sunlight, the continually repeated "tchay tchay tchay" note, usually preceded by "chichit," varying between a mouse-like squeal, when feeding, and a continuous "tchaaay" when scolding a Little Owl, and quite distinct from the similar note of a ringed Marsh-Tit, which I had examined carefully before releasing. A very high-pitched "eeze" of alarm and contact was also uttered, unlike anything I have heard from Marsh-Tits. The pale secondary patch, though present, was not very well marked. On January 17th, when visibility was poor, I was watching a pair of hitherto silent black-headed Tits in the same vicinity. One suddenly uttered a single snatch of sweet warbling notes, agreeing exactly with the Handbook's description of the song of the British Willow-Tit.

FIRECREST (*Regulus i. ignicapillus*). Also on January 11th I watched a Firecrest for about 20 minutes in the trees of Llandegveth churchyard. I had excellent though brief views of the characteristic facial markings and of the bright plumage, which I was able to compare vividly with a Goldcrest observed subsequently. The note, which was often repeated, was definitely less shrill than the Goldcrest's typical call. A Firecrest, which I saw near Cardiff in December, 1940, was reported in Vol. xxxiv, p. 200.

COMMON BUZZARD (*Buteo b. buteo*). I saw a pair in the north-west corner of the county in April, 1941, and on the 28th climbed to a nest containing some fresh larch twigs and one or two small feathers. I was unfortunately not able to revisit the nest, but I should say that it had certainly been used in a previous year.

BRUCE CAMPBELL.

A VARIATION IN THE CIRL BUNTING'S SONG.

IN no ornithological books with which I am acquainted is any mention made of a curious, occasional variation used by the

Cirl Bunting (*Emberiza c. cirrus*) during the course of its song. The rather dull little ditty suddenly stops for about one second and then continues at a considerably higher pitch. It is, of course, impossible to speak of this rise in pitch in strict terms of our musical scale, but I should put it very roughly at nearly an octave.

I had been living in Cirl country for over seven years before I proved this alteration, though I had suspected it before. But on May 13, 1921, a Cirl gave a clear demonstration at a few yards' distance. Since then I have heard it four or five times.

Only two people to my knowledge have noticed it, Mr. G. B. Gooch some four years ago, and Mr. W. B. Alexander, whose note appears in the *Report on the Birds of Oxfordshire, Berkshire and Buckinghamshire* (1940), and at whose suggestion I have written this.

It is singular that so far this variation has escaped more notice, which goes to prove how very "occasional," though unmistakeable, it is.

W. WALMESLEY WHITE.

NORTHERN TREE-CREEPER IN ORKNEY.

ON October 10th, 1941, a Tree-Creeper was found in a hot-house in Kirkwall and on being informed I went there and caught the bird. Before releasing the bird I examined it very carefully. The under-parts were very white, it had a strikingly white eye-stripe and white spots on the crown, while the rest of the upper-parts were much greyer than in British birds with which I am familiar. I have no doubt that it was an example of the Northern form (*Certhia f. familiaris*).

G. T. ARTHUR.

GREEN SANDPIPERS AND REDSHANKS SWIMMING AND DIVING.

WE notice in the new *Handbook* (Vol. iv), several references to the swimming powers of various waders, more particularly Sandpipers, Redshanks, etc. Diving is also mentioned in one or two cases. As there appear to be some gaps to be filled the following notes may be of interest.

GREEN SANDPIPER (*Tringa ochropus*).—In *British Birds*, Vol. xv, page 205, we recorded that on October 16th, 1921, "one was seen to swim out a yard or more and wash, fluttering and splashing in deep water, returning to repeat its performance close in shore." On November 1st, 1936 we saw an amusing encounter between one and a Black-headed Gull (*Larus r. ridibundus*). The Sandpiper was wading along the muddy edge of a reservoir, followed by the inquisitive Gull swimming close inshore. When the Sandpiper paused to preen, the Gull waded ashore and walked up to it, sending it

off in flight close to the water. But the Gull also took to its wings and followed so closely, that the Sandpiper swerved suddenly aside and alighted on the water, diving completely under when the Gull passed over. After reappearing it swam for a few moments and then took flight again quite effortlessly. Although this species usually feeds in shallow, quiet water at the edge of streams, ditches, etc., we watched one on October 7th, 1934 in a greatly swollen and very swiftly flowing by-wash of a reservoir. As it fed up stream its back was mostly awash and sometimes completely under water when it might easily have been mistaken for a Dipper.

COMMON REDSHANK (*Tringa totanus*).—Two out of a party of ten kept under observation on November 12th, 1933, were indulging in what looked like some form of display flight, one chasing the other low over the water, constantly uttering a low, rippling call. Once the bird which was being pursued alighted on deep water, when its pursuer flew around it, splashing in and out of the water until the swimmer was induced to take flight again. Whenever this bird alighted on the mud it was driven into flight again by the other. The remaining eight birds appeared to be quite unaffected by all this excitement.

GEOFFREY C. S. INGRAM AND H. MORREY SALMON.

ICELAND GULLS IN INNER LONDON.

ON the evening of February 20th, 1942, I saw an Iceland Gull (*Larus glaucoides*) on the frozen Round Pond, Kensington Gardens. I had an excellent view of it as it stretched its wings, and later when it swam in the open water. Its size, the white primaries and dull pink legs were distinctive features. Dr. G. Carmichael Low saw it subsequently and identified it as an Iceland Gull in its third or fourth year. The bird frequented the Round Pond and Long Water until March 7th when it finally departed.

On March 8th I watched a younger Iceland Gull on the Round Pond.

M. S. VAN OOSTVEEN.

BLACKCOCK ATTACKING DOG.

AT Crianlarich, Perthshire, in September, 1941, my dog, a cocker spaniel, got among a party of Blackgame (*Lyrurus t. britannicus*) amongst some rushes and put up the old hen and a young greyhen and cock. I saw him hunting others which had not yet flown, when the old cock got up, rose in the air, and then dived at the dog, striking him on the head with his feet. When he rose for a second attack the dog was ready and caught him at the foot of his dive. I could just see a cloud of feathers emerge from the rushes and when I got to the spot the dog had the old bird pinned to th

ground. I believe it is very unusual for a cock bird to defend a family, especially as the whole covey was perfectly capable of flying.

DAVID CHANCE.

[As Blackcock are normally polygamous and take no interest in their offspring it seems probable that the bird described was an exceptionally pugnacious old cock whose association with the others was merely fortuitous and that the attack was not really in defence of a family. In any case we know of no comparable instance, though cases are recorded of aggressive individuals of Capercaillie habitually attacking human beings (*cf.*, for example, L. Lloyd, *Game Birds and Wild Fowl of Sweden and Norway*, pp. 15-16).—EDS.]

CONTINENTAL JAYS IN KENT.—As further evidence of the Continental origin of the Jays recorded in Romney Marsh (*antea* p. 228) Dr. J. M. Harrison informs us that he received a specimen from Dr. A. McMillan shot at Brookland on December 14th, 1941, which he considers to belong clearly to the typical form (*Garrulus g. glandarius*). Dr. Harrison refers also to the intermediate character of a number of examples in a long series from Kent. This obtains also in birds from western parts of the Continent (*cf. Handbook*, Vol. 1, p.33).

WAXWINGS IN GREAT BRITAIN.—Dr. J. M. Harrison writes that one was seen by Lady Gweneth Cavendish at Ightham (Kent) on December 21st or 22nd, 1941.

SPOTTED REDSHANKS IN WINTER IN LINCOLNSHIRE, SUSSEX AND KENT.—Dr. J. M. Harrison informs us that an adult female Spotted Redshank (*Tringa erythropus*) was caught at Northcotes (Lincs) on November 25th, 1941, and a first winter male was shot at Rye Harbour (Sussex) on January 21st, 1942. Mr. H. R. Allen records one shot on Shirley Moor, near Tenterden (Kent) on December 7th, 1941.

REVIEWS.

The Breeding Distribution, History and Population of the Fulmar (Fulmarus glacialis) in the British Isles. By James Fisher and George Waterston. (Reprinted from the *Journal of Animal Ecology*, Vol. 10, No. 2, pp. 204-292, November, 1941).

THE remarkable increase and spread of the Fulmar has been one of the most spectacular and interesting events in British ornithology in this century and this important paper is the outcome of the 1934 enquiry into the status of the bird sponsored by the British Trust for Ornithology. The enquiry was conducted at first by Mr. G. Waterston, but as he was unable to continue and complete it he handed over all the documents to Mr. J. Fisher. The latter collected much further information both from correspondents and also personally and is responsible for the report itself. Besides the collating and dissecting of the material collected and the drafting of the report Mr. Fisher has made a very exhaustive search for past references to the Fulmar and this laborious task, which appears to have been very well done, was of great importance in tracing the increase and spread of the bird.

The first colony outside St. Kilda was established in 1878 at Foula and then in 1887 colonies were formed at Sula Sgeir and N. Rona, but the Orkneys were not reached until 1900 and the Scottish mainland two years later. It is indeed during the present century that the spread of the bird has been so remarkable and Mr. Fisher traces five directions in which this has taken place and gives details of 208 breeding colonies outside St. Kilda and 61 others where breeding has not yet been proved. The population of St. Kilda he considers to have remained stationary at 21,000 pairs and the birds outside he estimates at 40,500 breeding pairs in 1939. Though he disposes of the theory that the introduction of tinned food to St. Kilda affected the Fulmar population he points out that the drop in the human population and the abandonment of the island may have done so, since no young, in place of some 9,000 annually, have been taken in the last 10 years or so. But the great increase which has been taking place also in Iceland and the Færoes shows, as Mr. Fisher says, that the spread of the Fulmar is due to a biological change which is not understood. It will be interesting indeed to see what will happen in the future, for a much more important and more recent change than that at St. Kilda has been made in the Færoes where the killing of over 100,000 young Fulmars annually had been stopped owing to an outbreak of psittacosis traced to these birds.

Mr. Wynne-Edwards's theory of intermittent breeding in the Fulmar is discussed statistically, and in this connection we may draw attention to some cogent criticisms of the theory made by Mr. Lockley in his new book *Shearwaters* reviewed on this page.

Mr. Fisher not only deals in exhaustive fashion with the spread and population, but he also discusses a number of interesting points connected with the Fulmar's habits. Besides being of great present-day interest to all ornithologists, the report forms an invaluable basis for future surveys and Mr. Fisher, as well as all those concerned in its publication, are much to be congratulated.

Shearwaters. By R. M. Lockley. (Dent). Illustrated. 15s. net.

THIS is a fascinating book. It contains matter of great importance to ornithologists, told in such attractive style that no one at all interested in birds could fail to become absorbed in the story.

Just outside his house on Skokholm Mr. Lockley had a small colony of Manx Shearwaters ideal for study. Very little was known about the habits of the bird, as when not at sea it came to land in remote places, usually at night and lived underground. Thus Mr. Lockley had a great opportunity and he used this to the full. He evolved excellent schemes to overcome the difficulties of observation, and night after night, year after year he patiently unravelled the life history of the bird. By means of numbered rings he has been able to discover a great deal about the lives of individuals and his account of them is given in considerable detail. He has the gift of vivid description and he brings the scene so graphically before the reader as to hold his interest throughout.

The story has brought to light a number of interesting and remarkable facts and the Manx Shearwater has indeed proved to be a bird worth studying. To give some of these facts very briefly. We have the long incubation period of 51 to 54 days undertaken by the parents in shifts of three to five and sometimes even as much as seven to ten days. During these shifts the sitting bird, so Mr. Lockley discovers, does not leave the burrow and is not visited by its mate and so takes no food and loses weight. These prolonged absences of the mate give

point to the author's conclusion from the recovery of ringed birds that they sometimes go as far as the Basque coast in feeding flights, making a round journey of over a thousand miles from Skokholm and back again. Then there is the enormously long fledging period of 72-74 days, during the last ten or so of which the young bird is left to itself, and finally its journey from the burrow to the cliff and the sea and its almost certain death by predatory birds if it does not reach there before daylight comes. These and many other phases of the Manx Shearwater's life have been intensely observed and are here clearly and attractively described.

Mr. Lockley's well known homing experiments with Shearwaters are fully discussed. Perhaps the most remarkable of these was the return to Skokholm of three out of twelve birds released in Switzerland. That maritime birds should be able to find their way home across a continent is further definite proof that they have some unknown power of orientation, but it seems doubtful if such experiments will provide a solution of the mystery.

The last few chapters of the book describe how the author and his wife visited the Færoes, the Berlengas off Portugal, Madeira, the Desertas and the Salvages, on all of which islands they devoted their time and energies to searching for and observing petrels. The lively account of their adventures and the valuable observations they made add much to the attractions of this book, which should certainly be read by everyone interested in birds.

In Search of Northern Birds. By Seton Gordon, C.B.E. (Eyre & Spottiswoode). Illustrated with photographs. 15s. net.

IN this book Mr. Gordon takes us to Iceland and various Scottish islands as well as Lambay off the Dublin coast, he visits the Lockleys at Skokholm, has a good deal to say about Dotterels and other birds in the Highlands and devotes chapters to the wild cat and pine marten, seabirds and the war and hunting with a camera. The author has thus drawn on a wide range of experiences and although he has many interesting accounts of birds these do not figure so largely as the title might suggest and the book is rather one of varied interest with much about people and places as well as plants and the general scene.

In Iceland the author noted several cases of both drake and duck Eiders guarding the brood and he saw Arctic Terns hunting far over the dry moors, where they "stooped to pick up spiders and beetles, on which they largely fed their young." On Noss Mr. Gordon saw Great Skuas killing a Kittiwake and constantly attacking them and Gannets, but on Hermaness, he says, they rarely molest birds and he thinks that the Noss colony is now too large for the available food supply, but this colony is small compared with that at Hermaness, where there are surely more than the 90 pairs given by Mr. Gordon. Rather casual mention is made of a Buzzard seen on Lambay in March and as the bird is so rare now in Ireland it is a pity that the year of the observation is not given. The author has some interesting remarks about Gannets, which he has constantly observed passing Skye on their return to St. Kilda from their fishing grounds—a distance of at least 80 and probably 100 miles. On page 198 we are told that "there is reason to believe" that Ospreys bred in 1916 in a small pine on the shore of a loch near Loch Arkaig, but unfortunately the reason for the belief is not stated. Such a statement is of little value without the evidence and surely it could do no harm to give the details. Mr. Gordon writes pleasantly and takes excellent photographs and this book should find a wide circle of readers, while there is much in it of special interest to bird observers.

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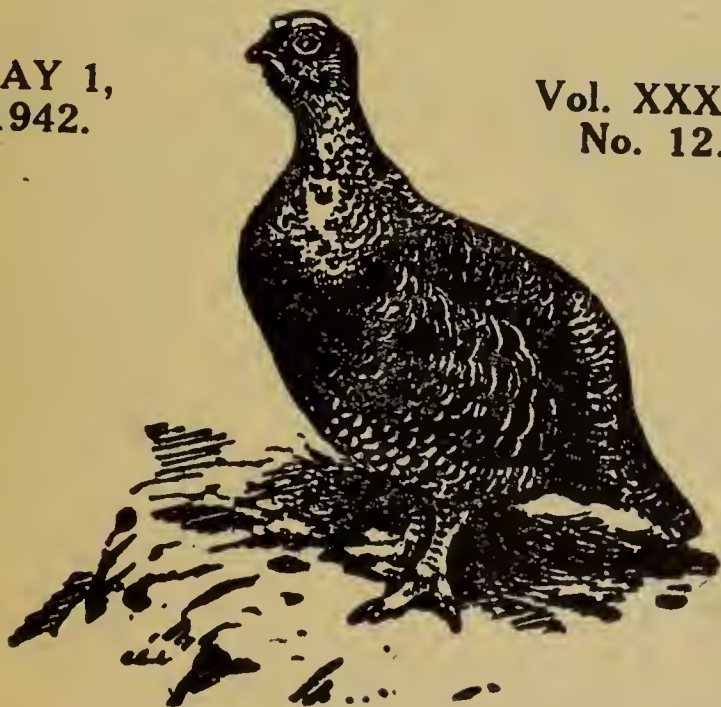
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ASSISTED BY

NORMAN F. TICEHURST, O.B.E., M.A., F.R.C.S., M.B.O.U., AND

BERNARD W. TUCKER, M.A., F.Z.S., M.B.O.U.

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BIRDS OF INNER LONDON

BY

G. CARMICHAEL LOW AND M. S. VAN OOSTVEEN.

IN 1929 Mr. A. Holte Macpherson (*British Birds*, xxii, pp. 222-224) gave a list of the Birds of Inner London and since that date has contributed additional yearly notes up to and including 1940. As he has left London now, however, to live in Exmouth, he finds himself unable to continue these and we have been asked to carry on the work in his place.

As in 1940 the present notes are incomplete owing to many observers still being occupied in National Service and also to the fact that some of those who are left are not aware of the change of authorship and have not therefore sent us any notes.

Further the shooting and extensive air raids experienced in London during the year had a detrimental effect upon the ducks, many of these being killed while others were driven away and did not readily come back again. Nevertheless some interesting occurrences have been noted and these we now give.

ADDITIONAL NOTES IN 1941.

JACKDAW (*Corvus m. spermologus*). The colony in the S.W. corner of Kensington Gardens still exists. There were six pairs in the spring, some of these nested and reared one or two young ones, but by November all these and most of the adults had gone and only five were left. Some came back in December, however, sixteen being counted one morning.

JAY (*Garrulus g. rufitergum*). A pair frequented Kensington Gardens all summer and may have bred, as in October three were seen several times in and about the Sanctuary by the Long Water; one in Green Park, on November 14 (E. M. Nicholson).

GOLDFINCH (*Carduelis c. britannica*).—Several were seen in Battersea Park by Mr. T. L. Bartlett on October 29th.

YELLOW WAGTAIL (*Motacilla f. flavissima*).—One crossed over the Round Pond on August 31st and another on September 4th (G.C.L.).

GREY WAGTAIL (*Motacilla c. cinerea*).—One, St. James's Park on September 29th (W. R. Philipson), one, Tower Bridge on November 15th (C. A. White).

WHITE WAGTAIL (*Motacilla a. alba*).—One was seen (second record for Inner London) on March 24th by one of us (G.C.L.) on the allotment to the east of the Albert Memorial, Kensington Gardens.

TREE-CREEPER (*Certhia f. britannica*).—One seen in Kensington Gardens (G.C.L.), February 5th, and two in trees east of Bandstand, March 6th (G.C.L.).

SPOTTED FLYCATCHER (*Muscicapa s. striata*).—Two pairs nested in Kensington Gardens, while Mr. T. L. Bartlett frequently saw one in St. James's Park between June and August. On August 12th two young ones appeared, and one was ringed by him.

GOLDCREST (*Regulus r. anglorum*).—One behind Peter Pan, November 4th (G.C.L.).

CHIFFCHAFF (*Phylloscopus c. collybita*).—Heard in Kensington Gardens on September 9th, 17th and 25th by us, and in Warwick Square, Pimlico (M.S.v.O.).

WILLOW-WARBLER (*Phylloscopus t. trochilus*).—Several on spring and autumn passage in Kensington Gardens (G.C.L.).

SEDGE-WARBLER (*Acrocephalus schænobænus*).—One, St. James's Park on April 29th (W. R. Philipson).

BLACKCAP (*Sylvia a. atricapilla*).—Was heard singing in the Peter Pan Sanctuary, Kensington Gardens, on May 28th and 29th (M.S.v.O.).

REDWING (*Turdus m. musicus*).—Small flocks between February 4th and 24th, Kensington Gardens (G.C.L.).

BLACK REDSTART (*Phœnicurus o. gibraltariensis*).—For occurrences in Inner London *vide* R. S. R. Fitter, *antea* pp. 206-7.

KINGFISHER (*Alcedo a. ispida*).—One, Regents Canal in Zoo, June 17th (A. B. Hornblower).

GREAT SPOTTED WOODPECKER (*Dryobates m. anglicus*).—A pair frequented Kensington Gardens from February till May 22nd; they then left and did not nest.

LESSER SPOTTED WOODPECKER (*Dryobates m. comminutus*).—One was heard calling on Campden Hill on February 15th and another was observed drumming in the top of a wych elm in Kensington Gardens on May 2nd (M.S.v.O.). Another, Hyde Park, October 1st (Sir Cyril Hurcomb).

CUCKOO (*Cuculus c. canorus*).—A young bird seen Kensington Gardens, September 7th. (G.C.L.)

TAWNY OWL (*Strix a. sylvatica*).—One pair at least bred in Kensington Gardens.

PEREGRINE FALCON (*Falco p. peregrinus*).—One flying high over Westminster, July 7th (R.S.R. Fitter and J. E. Roberts).

KESTREL (*Falco t. tinnunculus*).—One flew into Kensington Gardens from the west, stooped down to the edge of the Round Pond, picked up a Sparrow and flew off with it.

SCAUP (*Aythya m. marila*).—One, Waterloo Bridge between January 29th and March 10th (K. E. Hoy).

GANNET (*Sula bassana*).—One, Waterloo Bridge, January 28th (K. E. Hoy).

GREAT CRESTED GREBE (*Podiceps c. cristatus*).—A pair, Round Pond, Kensington Gardens, March 14th.

LITTLE GREBE (*Podiceps r. ruficollis*).—Two, Round Pond, Kensington Gardens, March 14th (Sir Cyril Hurcomb), one, March 21st, another, September 5th, while Mr. T. L. Bartlett saw one in St. James's Park on October 20th.

RED-THROATED DIVER (*Colymbus stellatus*).—One, Round Pond, Kensington Gardens, January 27th to February 1st. One, Serpentine, Hyde Park, February 1st to 2nd (G.C.L.).

STOCK-DOVE (*Columba oenas*).—Several pairs resident and breeding Kensington Gardens.

CURLEW (*Numenius a. arquata*).—On April 1st at 11.30 p.m. one was heard calling as it passed over Campden Hill (M.S.v.O.). One flew around Round Pond, Kensington Gardens, calling, November 8th (G.C.L.). It was foggy up above at the time.

COMMON SANDPIPER (*Actitis hypoleucos*).—Long Water, Kensington Gardens, one, August 25th, September 8th and 12th.

LAPWING (*Vanellus vanellus*).—A flock of twelve flew over the west side of Kensington Gardens, February 28th (G.C.L.).

COMMON TERN (*Sterna hirundo*).—One, Round Pond, Kensington Gardens, September 20th (G.C.L.). One, St. James's Park, September 29th (W. R. Philipson).

LESSER BLACK-BACKED GULL (*Larus fuscus fuscus* and *L. f. graellsii*).—One or two from time to time, Round Pond and Long Water.

GREAT BLACK-BACKED GULL (*Larus marinus*).—One, Round Pond, January 27th (G.C.L.). One, Serpentine, April 22nd (Sir Cyril Hurcomb).

GLAUCOUS GULL (*Larus hyperboreus*).—One, Round Pond, December 25th (Sir Cyril Hurcomb); second record for Inner London.

KITTIWAKE (*Rissa t. tridactyla*).—On April 23rd, Mr. T. L. Bartlett observed a Kittiwake on the unfinished pontoon bridge opposite County Hall, Westminster.

EFFECTS OF BAITING ON THE MARSH-TIT

BY

AVERIL MORLEY.

THE following observations were made on a small population of colour-ringed and some unringed Marsh-Tits (*Parus p. dresseri*), in part of a wood, of oak standard with some secondary and scrub in north Berkshire. In order to mark the unringed birds in the autumn and winter of 1939-40, 1940-41, 1941-42, they were attracted to a wire drop-trap by means of bait. The bait used was broken-up peanut, or hempseed when the former was unobtainable. Scattered observations on other tit species are also recorded.

Trapping began on October 21, 1939, when the trap was placed in the centre of a Marsh-Tit territory, and bait (which then included coconut) was liberally sprinkled on the ground and suspended on the branches near by, while on other Marsh-Tit territories similar concentrations of bait were placed. No baits were known to be taken by birds until November 4, after which Great Tits (*Parus major*), Blue Tits (*Parus caeruleus*) and Coal-Tits (*Parus ater*) took them; the first Marsh-Tit at bait was seen and caught on November 18. In following autumns the gap between first putting out of bait and the discovery of it by tits was not so great as on the first occasion, and it was evident that those previously accustomed to bait as food "realized" its significance in succeeding years. The area was usually visited every other day, with a few gaps, none longer than a fortnight.

BAITING ASSOCIATIONS. By always placing bait on one spot in a territory the tits at first associate probability of bait with that place, and the presence of the bait-giver near by as indicating in the immediate future a supply of bait in that place. This was shown by their coming to, or greeting, the bait-giver (see below) and then flying to the place without waiting for the bait-giver to move first in that direction, and sometimes flying back to the bait-giver, and so on. If they had had no experience of bait away from the special place they failed to recognize it at various distances from the place, even (once) so close as 4 yards away, and the bait-giver's action of spreading it on the ground (the significance of which they realized at the place) held no meaning for them. For bait one yard from the place recognition was complete.

In the second year of baiting, birds came, however, to associate and make complete response to bait with the bait-

giver wherever the latter was, even distant from the place, instead of with the special place. This arose spontaneously in a pair after 3 baitings (within seven days) in their second years' experience of bait (November, 1940), the same pair whose feat of "memory" is recorded below. It was found later that this association could be induced by, after greeting, putting down bait, moving a few yards off and repeating the action several times, making the bait as conspicuous as possible. One tit will come to realize the significance of the action and others will immediately follow suit. It may be said here that tits are very quick to copy the example of others; for instance, when (already used to bait) they are first introduced to the trap and are at a loss to find the way to the familiar bait, the correct solving of the problem by one tit is immediately followed by others; whether this is true imitation or attention directed to the relevant part is not easy to decide.

REACTION TO BAIT-GIVER. There are two types of reaction to the bait-giver by the Marsh-Tit, according to its social standing. (a) *Territory owners* in their territories fly purposefully to the bait-giver, often, especially the male, uttering the well-known "pitchou" note. Intrusion by humans on to any Marsh-Tit area sometimes produces this reaction from the owner, but in greeting the bait-giver the bird hangs around giving the note repeatedly, instead of soon flying away as happens in the other case. The note has, among various uses, the advertisement-use of song, as which it may often be regarded functionally, and its use in the greeting may be paralleled in the experience of Burkitt (1924) whose tamer Robins (*Erithacus rubecula*) used to being fed sang at sight of him. They frequently utter also excitement cries, sequences of soft, high "tsit, tit, sip" notes. Sometimes in flights around the bait-giver (usually at latter's head level) the wings are flirled to make quite a loud flirting sound. This action appears in natural aggressive and sexual contacts, seeming primarily an advertisement of presence, with an occasional function of threat. Frequently the wing-tips are jerked or twitched, also an excitement action in many natural situations, including sight of abundance of natural food e.g. honeysuckle berries (*Lonicera*). (b) *Birds without territories*. Such birds, which are subordinate to the owners into whose areas they travel with the tit-flock and behave in an inconspicuous and negative manner till seeking to establish territories (which males begin to do from January), fly purposefully

to the bait-giver but in silence, and have only once been recorded (January) as uttering even excitement cries. They sometimes jerk wing-tips, which, as excitement cries, is a private exhibition of emotion, whereas the wing-flirt and "pitchou" have "intended" valence for external objects.

Territory owners enticed by prospect of bait into a neighbour's area react to bait and bait-giver in the same inconspicuous and silent fashion.

The tits have possibly regarded all humans as bait-givers, as they have greeted at least one non-bait-giver (whose clothes did not correspond to the writer's, being of the opposite sex), and did not seem deterred from greeting when the bait-giver was accompanied by another person or, once, by a small quiet dog; a large airedale drew the same aggressive "pitchou" reaction as a fox. Nor do they vary their behaviour at all according to the colour or tone of clothes and hats worn by the bait-giver; one Marsh-Tit shortly after greeting, and while still close to the bait-giver, gave the strongest alarm reactions to a white-haired woman at c.40 yards distance, but probably it was the character of whiteness bright in sunlight which startled the bird, rather than distinction between a stranger and the familiar bait-giver. It would seem, indeed, that the releasing factor for their acquired reaction is extremely simple, an object of human attitude moving. This simplicity is in line with some other known releasing factors, *viz*, that for attack in the Robin (Lack, 1939), the Bittern (*Botaurus stellaris*), and the sexual and social reactions of the Budgerigar (*Melopsittacus undulatus*) described by Lorenz (1937). This bald simplicity goes hand in hand with the ability to distinguish individuals in their species; the Robin distinguishes its mate from other Robins, and the Marsh-Tit can distinguish not only its mate but, like the Song-Sparrow (*Melospiza melodia*) recorded by Nice (1937), its neighbours, whom it can pick out in the flock, and apparently distinguish from the subordinate flock Marsh-Tits, up to a distance of 60 yards at least. Reactions to the bait-giver have occurred up to c.50 yards distant; possibly the tits react not only to the sight of a human but also to the noise of a human moving through bracken, etc., as they have started greeting cries when I have been well screened from them by bushes. There is one piece of evidence of ability to distinguish the bait-giver personally: about 10 minutes after baiting, when the writer was walking on the road at the wood-edge where people are always walking and several were in the vicinity at the time,

the tits made excited and definite greeting, flying out across the road.*

BEHAVIOUR AT THE BAIT AND TRAP. In ordinary tit fashion Marsh-Tits fly down, seize a piece of bait in the beak (dominant and confident birds may shovel in several) and fly off with it to some branch where it is transferred to the feet and eaten. Hiding bait in cracks in bark and dead bough-ends has been seen, as Hibbert-Ware (1929) recorded. A bird later driven away from the bait was seen to return to a hiding place and extract the nut placed there a short while before.

Dominant, territory owners feeding freely and fearlessly at bait do not usually interfere much, if at all, with subordinate flock-birds or Coal-Tits (over which Marsh-Tits are normally dominant), which take their turn. If, however, the dominant bird has been trapped it may show doubt and hesitancy for one or more days ; it then becomes very tyrannical and though too fearful to enter the trap itself, finds a vent for its balked desire by driving off all subordinate to it, so that these are difficult to catch if need be for banding. A subordinate bird which has been much bullied at the trap becomes so nervous that even when the coast is clear and the tyrants otherwise engaged it is unable to gain enough confidence to enter, though much attracted by the bait. Unconfident birds of both categories use at the trap a Blue Tit-like scolding, rapid "ter-cherrerrerrrr." As territory-owning Marsh-Tits do not normally enter neighbours' areas even for easy food, the number of the species possible to catch at one bait-station is potentially more limited than the Blue Tit (Colquhoun, 1942).

On a few occasions a territory owner has been enticed into a neighbour's area where it then acts as described. Moreover it flies from the owner at sight, as if conscious of guilt, whereas the flock-bird waits till attacked and does not mind some driving if it can sometimes get bait. If the bait is moved into the trespasser's area (perhaps only a matter of 20 yards) the characteristic actions of trespasser and owner are identically reversed.

If one of a pair is caught in the trap the other usually

* On February 21st, 1942, a postman in a broadcast stated that certain birds he habitually fed recognized him not only in his postman's uniform but also in his Home Guard uniform, and could distinguish him from his fellow Home Guardsmen. In *Zoologist* 1848, pp.2024-2026, is an account of a Whooper Swan's (*Cygnus cygnus*) ability to distinguish humans.

shows disturbance and distress, but when the trapped bird is transferred to the hand, and is transformed from a fluttering, struggling and perhaps ejaculating object into a silent, still one, the mate ceases to be so concerned. After ringing, several birds, of both categories, uttered the submission note, a plaintive "chee, chee." Marsh-Tits have not been seen to posture at the trap, but a Blue Tit, accustomed to bait, when first confronted with the trap over the bait, for several minutes at intervals raised its crest, puffed out the cheek-feathers and pointed its bill at it in the aggressive attitude.

If the bait is not put down after greeting, the tits proceed to look for it, perching near the ground and scanning it minutely. From a few feet distance the Marsh-Tits' heads can be seen to be in constant, rapid, but tiny motion, as if on a spring slightly vibrating. Perhaps this aids in the detection of immovable objects on the principle of rapid peering (Grinnell, 1921).

STRENGTH AND PERSISTENCE OF REACTION. Reaction to the bait-giver, complete to the last step of taking the bait, is perfect, after establishment, after absence (of bait-giver or bird) of various degrees, *viz.* ten, twenty-one and forty-eight days; one pair after 335 days (11 months) without baiting responded perfectly to a whole situation of trap-bait-giver-traditional place. A flock-bird after 61 days absence greeted, but the reaction was not persistent enough to carry it through to the conclusion of taking bait provided. Hibbert-Ware (1929) records a Marsh-Tit performing (October 13) after about 183 days a signal for food identical to one employed in the preceding spring. These do not equal the record of wild Rooks (*Corvus frugilegus*) which, accustomed to a bait with snow association for two or three winters, responded to snow in their third winter of absence (*Trans. North Staffs Field Club*, xlvii, 1912-1913, p. 74).

An obscure but interesting point is failure to react on the part of formerly reacting birds, which starts spasmodically from January but is not fully developed till end of April. The bird may greet but loses interest and flies off, or even if going down to the bait, does so perfunctorily, and leaves after taking one or two pieces; or it may on occasions completely ignore a presence it was so quick to detect and respond to a few weeks before. It is as if, its interest and energy being devoted to one goal, it is unable to complete an action which leads to another goal. Burkitt (1924) records inability to trap Robins after March 4th, 1923, as the birds took no notice of the bait.

With Marsh-Tits it can hardly be an ampler food supply in spring which makes them unresponsive. In the abnormally backward 1941 spring one pair showed slackened interest or ignored the bait, were recorded as last taking bait on April 8th, and the male made an incomplete reaction on April 22nd. On September 11th the pair spontaneously reacted to the bait-giver, who had been near them many times in the intervening period. Without actual sampling of the food-supply one cannot be dogmatic, but to human observation natural food was more abundant in September than in March, April and early May, when frosts were still of nightly occurrence and snow fell.

However, up to the coition period the various behaviour patterns may be broken up and abandoned, when the bait-giver is perceived, for greeting ; or the presence of the bait-giver, being an event which normally raises the excitement level of the birds, has been noticed to stimulate them, after greeting, to a fresh bout of hole-visiting activity, and the same effect is caused by other emotional level raisers, such as fights with neighbours on territory boundaries, or scraps with Blue Tits.

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ORNITHOLOGY.*

REPORT OF THE BIRD-RINGING COMMITTEE:

PROGRESS FOR 1941.

A. LANDSBOROUGH THOMSON, C.B., D.SC.

Chairman of the Committee.

THIS is the fifth annual report to be issued on behalf of the Bird-Ringing Committee of the British Trust for Ornithology.* The series continues the sequence of reports by H. F. Witherby published from 1910 onwards under the title "*The British Birds Marking Scheme.*"

War conditions have restricted activities to a much greater extent than during 1940, but useful work has been done.

MANAGEMENT.

The headquarters of the scheme remain in the British Museum (Natural History), by permission of the Trustees, and rings are inscribed "BRITISH MUSEUM NAT. HIST. LONDON."

The composition of the Committee remains as before. The headquarters work continues to be done by the Honorary Secretary, Miss E. P. Leach, without assistance. She is giving her whole time to it, and the successful maintenance of the scheme is due entirely to her skilful and devoted labours.

FINANCE.

The financial position remains satisfactory. A subvention from *British Birds* has again been received. In the absence of opportunity for special developments, it has not been necessary to draw upon the grant made by the trustees of the late Viscount Leverhulme—and the sum previously used for increasing the reserve stock of rings has indeed been repaid.

PROGRESS OF RINGING.

The war has caused a heavy reduction in the number of birds ringed, and the total of 7,099 is the smallest for any year since 1920: the fall is most noticeable in respect of birds trapped. Rings were issued to 22 new co-operators, not all of whom were able to do any ringing during the year. Rings have been issued to Mr. M. K. Colquhoun for the Wood-Pigeon Investigation, under the auspices of the Trust, for which a grant is being made by the Agricultural Research Council.

* The previous report was published in *British Birds*, 1941, Vol. xxxv, p.9.

The first Garganey to be ringed under the scheme was caught at Orielson Decoy. The famous Black Redstarts of Westminster were ringed by members of the London Natural History Society. Messrs. Appleyard, Willis and Rowntree ("Wippletree") have ringed a large number of Dippers for purposes of special observation and hope to continue their investigation. Almost as many Roseate Terns were ringed in 1941—by Messrs. Cowin, Ladds and Williamson in the Isle of Man, and by Messrs. Rankin in Ireland—as in all previous years together.

ECONOMY IN USE OF RINGS.

Attention must be drawn to frequent failure to observe the present restrictions on the ringing of certain species: too many such birds have been ringed without any special object in view. Aluminium being now unobtainable, economy in the use of rings—irrespective of date of issue—is essential in order to conserve supplies for the more remunerative species.

RECOVERIES.

A few records of individual interest may be mentioned. A Woodcock ringed as a nestling in Kirkcudbrightshire in 1937 was recovered near Moscow in May, 1940—another case of a bird of this species being found outside its native country in the breeding season. The first ringed Snipe to be reported from abroad was one ringed as a young bird in Sussex in 1935 and recovered in Asturias, Spain, in December, 1941.

Another Kittiwake, one ringed on Fair Isle, has been reported from Newfoundland, making the eighth transatlantic record for the species. A Meadow-Pipit ringed at Malvern in October, 1937, was caught at a lighthouse near Drogheda, Ireland, in January, 1942.

A fourteen-year old Lapwing has been recovered in Co. Limerick, having been ringed in Kirkcudbrightshire in 1928.

The third of the appended tables shows a large jump in the totals for Hedge-Sparrow, Tree-Sparrow, Greenfinch and Yellow Bunting, but this is due to the inclusion of arrears from an active trapping centre.

PUBLICATION OF RESULTS.

The following publication has been made for the Committee since the last report:—

E. P. Leach (1941): "Recovery of marked birds." *British Birds*, Vol. xxxv, pp. 149 and 174.

In addition, many short summaries of ringing results for various species have been included in *The Handbook of British Birds*, now completed by the appearance of its fifth volume.

NUMBER OF BIRDS RINGED.

				<i>Trapped.</i>	<i>Nestlings.</i>	<i>Total.</i>
In 1941	...	...	...	3,109	3,990	7,099
„ 1940	...	...	...	14,974	6,208	21,182
„ 1939	...	...	...	27,983	27,834	55,817
„ 1938	...	...	...	24,162	26,162	50,324
„ 1937	...	...	...	21,900	23,281	45,181
„ 1936	...	...	...	19,235	29,428	48,663
„ 1935	...	...	...	16,066	30,364	46,430
„ 1934	...	...	...	17,835	31,816	49,651
„ 1933	...	...	...	10,466	27,975	38,441
„ 1932	...	...	...	7,643	22,950	30,593
From 1909 to 1931	...	...	...	...	...	316,955
Grand Total (including arrears)				710,739.		

INDIVIDUAL TOTALS FOR 1941.

	<i>Trapped.</i>	<i>Nest- lings.</i>	<i>Total.</i>		<i>Trapped.</i>	<i>Nest- lings.</i>	<i>Total.</i>
Oxford Orn Soc.	566	12	578	A. H. Bishop ...	—	31	31
Cowin Ladds & Williamson ...	14	443	457	M. Stewart ...	27	4	31
Bootham Sch.	241	97	338	R. Carrick ...	8	22	30
London N.H.S.	67	207	274	J. Law... ...	27	—	27
A. J. Harthan	224	27	251	Miss Ruth Baillie ...	26	—	26
M. & D. Rankin	20	221	241	G. K. Robinson	—	26	26
R. H. Brown ...	5	203	208	St. Edmund's Sch.	4	19	23
H. M. Rogers ...	43	163	206	J. F. Stirling ...	13	10	23
Sedbergh Sch.	20	184	204	H. C. Trimmell	6	17	23
Bryanston Sch.	171	20	191	F. J. Ramsay ...	18	4	22
Miss Ferrier ...	—	165	165	R. M. Band ...	6	15	21
W. Pollok-Morris	2	142	144	Bedale's Sch. ...	—	21	21
A. E. Billett ...	10	129	139	Mrs. Anscombe	1	19	20
L. G. Weller ...	82	45	127	P. A. Rayfield	—	20	20
W. Macve ...	6	120	126	C. F. Tebbutt...	10	8	18
A. Darlington...	29	84	113	Sir S. Bilsland	—	15	15
Winchester Coll.	110	—	110	M. E. Glanvill...	1	13	14
W. A. Cadman	1	105	106	L. D. Thomas...	14	—	14
A. Wainwright	2	98	100	Kingswood Sch.	2	11	13
T. H. Bell ...	41	57	98	R. H. Daly ...	—	12	12
Mrs. Hodgkin...	7	88	95	Lord Hamilton	—	10	10
J. Bartholomew	5	88	93	R. E. Knowles	5	3	8
Zool. Society ...	71	19	90	R. Chislett ...	—	7	7
R. Martinson ...	10	74	84	M. Hardy ...	1	5	6
Cheltenham Coll.	2	80	82	A. Jucker ...	6	—	6
E. Cohen ...	25	54	79	A. E. Williams	6	—	6
M. S. Brett ...	71	—	71	P. Hollom ...	1	4	5
W. B. Maltby...	19	52	71	Miss Hutchinson	—	4	4
A. H. Eggeling	21	45	66	P. Morshead ...	—	4	4
Repton Sch. ...	—	63	63	J. Ash ...	—	3	3
Sandford, Stephen, & Pollok-Morris	3	60	63	Lord D. Stuart	—	3	3
D. Garnett ...	27	33	60	J. G. Warner ...	—	3	3
A. W. Boyd ...	1	57	58	E. Wishart ...	3	—	3
J. A. Gibb ...	55	1	56	Cambridge B.C.	—	2	2
Shrewsbury Sch.	20	17	37	A. G. Mason ...	2	—	2
Gresham's Sch.	—	35	35	H. Tully ...	2	—	2
C. Oakes ...	2	33	35	Woodcock Inq.	—	2	2
J. Ellis... ...	—	33	33	C. J. Gent ...	1	—	1

The following include also totals for 1940 :—

Wildfowl Inq....	742	—	742	J. Staton ...	30	4	34
P. Hirst ...	13	175	188	J. S. Hewitt ...	21	2	23
" Wippletree "	15	132	147	A. A. Adams ...	9	—	9
E. G. Holt ...	96	—	96				

NUMBERS OF EACH SPECIES RINGED					RECOVERED		
	1909 to 1940	1941 Trapped	Nest- lings	Total	Grand Total	of those ringed 1909-40	Per centage
Raven ...	214	1	14	15	229	15	7.0
*Crow, Carrion...	1588	1	42	43	1631	74	4.7
Rook ...	5011	9	2	11	5022	239	4.8
Jackdaw ...	3992	30	3	33	4025	193	4.8
*Magpie ...	1074	5	55	60	1134	38	3.5
Jay ...	498	1	27	28	526	31	6.2
Chough ...	44	—	5	5	49	3	6.8
Starling ...	68796	591	51	642	69438	3055	4.4
Greenfinch ...	29507	331	83	414	29921	2374	8.0
*Goldfinch ...	474	—	18	18	492	8	1.7
Redpoll, Lesser	589	—	4	4	593	6	1.0
Linnet ...	10164	2	49	51	10215	69	0.7
Bullfinch ...	1572	—	11	11	1583	59	3.8
Chaffinch ...	33207	289	32	321	33528	1449	4.4
Brambling ...	1006	1	—	1	1007	40	4.0
Sparrow, Tree	2330	5	—	5	2335	87	3.7
Bunting, Yellow	5656	75	27	102	5758	404	7.1
Bunting, Reed	1861	6	9	15	1876	95	5.1
Lark, Sky ...	3674	9	4	13	3687	47	1.3
Pipit, Tree ...	1785	—	8	8	1793	5	0.3
Pipit, Meadow	5429	1	26	27	5456	116	2.1
Pipit, Rock ...	668	—	3	3	671	30	4.5
Wagtail, Yellow	1053	—	6	6	1059	4	0.4
Wagtail, Grey	848	1	7	8	856	1	0.1
Wagtail, Pied...	6612	3	93	96	6708	89	1.3
Wagtail, White	79	—	—	—	79	—	—
Flycatcher, S.	3423	7	16	23	3446	11	0.3
*Flycatcher, Pied	1382	2	35	37	1419	9	0.7
Chiffchaff ...	950	5	15	20	970	6	0.6
Warbler, Willow	10402	8	31	39	10441	52	0.5
Warbler, Wood	1022	—	36	36	1058	2	0.2
Warbler, Sedge	1289	—	10	10	1299	7	0.5
Warbler, Garden	1292	—	6	6	1298	5	0.4
Blackcap ...	919	—	18	18	937	2	0.2
Whitethroat ...	4833	11	20	31	4864	33	0.7
Thrush, Mistle	4743	12	43	55	4798	104	2.2
Thrush, Song ...	67720	75	322	397	68117	1359	2.0
Redwing ...	961	1	—	1	962	7	0.7
Ouzel, Ring ...	530	—	5	5	535	5	0.9
Blackbird ...	60504	205	119	324	60828	2897	4.8
Wheatear ...	1873	3	5	8	1881	39	2.1
Whinchat ...	1636	—	18	18	1654	12	0.7
Stonechat ...	841	—	1	1	842	5	0.6
Redstart ...	2085	—	28	28	2113	15	0.7
Robin ...	23364	62	22	84	23448	2260	9.7
Sparrow, Hedge	15248	26	8	34	15282	1418	9.3
Wren ...	3779	7	1	8	3787	24	0.6
Dipper ...	1406	10	82	92	1498	17	1.2
Swallow ...	43878	10	499	509	44387	409	0.9
Martin ...	11968	22	150	172	12140	80	0.7
Martin, Sand ...	4607	16	—	16	4623	11	0.2
*Swift ...	972	3	3	6	978	60	6.2
Kingfisher ...	707	—	—	—	707	32	4.5
Cuckoo ...	744	—	7	7	751	21	2.8

	NUMBERS OF EACH SPECIES RINGED				Grand Total	RECOVERED	
	1909 to 1940	Trapped	1941 Nest- lings	Total		of those ringed 1909-40	Per centage
*Owl, Little ...	626	1	9	10	636	58	9.3
Owl, Long-eared	218	—	—	—	218	7	3.2
Owl, Barn ...	615	—	2	2	617	61	9.9
Owl, Tawny ...	989	7	25	32	1021	61	6.2
Falcon, Peregrine	84	—	6	6	90	7	8.3
*Merlin ...	253	—	3	3	256	51	20.2
Kestrel ...	940	1	12	13	953	96	10.2
*Buzzard ...	339	—	37	37	376	13	3.8
Hawk, Sparrow	543	3	48	51	594	75	13.8
Heron, Common	2189	1	22	23	2212	267	12.2
Duck, Sheld-...	473	—	—	—	473	22	4.7
Mallard ...	6887	30	54	84	6971	1113	16.2
Teal ...	2584	726	11	737	3321	389	15.1
Wigeon ...	424	—	—	—	424	60	14.2
Duck, Tufted ...	177	—	—	—	177	36	20.3
Goosander ...	52	—	—	—	52	10	19.2
Cormorant ...	2456	—	—	—	2456	505	20.6
Shag ...	1878	1	54	55	1933	192	10.2
Gannet ...	10214	—	—	—	10214	342	3.3
Petrel, Storm ...	571	—	—	—	571	41	7.2
Shearwater, Mx.	19980	25	—	25	20005	1011	5.1
Petrel, Fulmar	354	8	7	15	369	1	0.3
Pigeon, Wood-	2823	3	36	39	2862	109	3.9
Dove, Stock ...	649	2	4	6	655	56	8.6
Dove, Turtle ...	661	2	—	2	663	75	11.3
Curlew, Stone-	251	—	2	2	253	10	4.0
Oyster-catcher	1553	—	40	40	1593	63	4.1
Plover, Ringed	1491	1	23	24	1515	19	1.3
Plover, Golden	322	—	3	3	325	8	2.5
Lapwing ...	39178	2	493	495	39673	841	2.1
Dunlin...	114	—	—	—	114	1	0.9
Sandpiper, C. ...	896	—	5	5	901	3	0.3
Redshank ...	2300	1	23	24	2324	79	3.4
Curlew, Common	3115	—	30	30	3145	125	4.0
Snipe, Common	1627	5	14	19	1646	86	5.3
Woodcock ...	5305	1	20	21	5326	407	7.7
Tern, Sandwich	17793	—	194	194	17987	316	1.8
Tern, Roseate...	205	—	188	188	393	1	0.5
Tern, Common	19659	—	11	11	19670	470	2.4
Tern, Arctic ...	2727	—	68	68	2795	11	0.4
Tern, Little ...	808	—	4	4	812	8	1.0
Gull, B.-headed	13914	3	185	188	14102	660	4.7
Gull, Common	1820	1	3	4	1824	62	3.4
Gull, Herring ...	8672	—	26	26	8698	233	2.7
Gull, L. Bl.-bkd.	10717	—	—	—	10717	413	3.9
Gull, G. Bl.-bkd.	587	—	25	25	612	21	3.6
Kittiwake ...	1905	—	47	47	1952	26	1.4
Skua, Great ...	518	—	—	—	518	17	3.3
Razorbill ...	4548	—	4	4	4552	95	2.1
*Guillemot ...	2455	—	5	5	2460	53	2.2
Puffin ...	5404	2	1	3	5407	90	1.7
Crake, Corn	524	8	—	8	532	8	1.5
Moorhen ...	1680	28	3	31	1711	45	2.7

NOTES

WATER-PIPIT IN KENT.

WHILST walking along a ditch on an East Kent marsh, on April 5th, 1942, we came upon a Water-Pipit (*Anthus s. spinoletta*) and were able to get a view of the bird at about 10 yards range. We noticed the pale, almost unstreaked under-parts, and the greyish upper-parts, especially on the head. The white eye-stripe appeared particularly prominent, and we also saw the white on the outer tail-feathers. When the bird flew off it failed to utter any note.

J. G. HARRISON AND
T. C. GREGORY.

RED-SPOTTED BLUETHROAT SEEN IN HERTFORDSHIRE.

ON March 4th, 1942, I was walking near the fringe of wood at the northernmost end of Elstree Reservoir, when I disturbed a bird, which had been sheltering in a thick bush. (It was raining at the time). The bird hopped on to a fence about twelve feet from me and revealed itself to be a Red-spotted Bluethroat (*Luscinia s. svecica*): there could be no mistaking it.

On the upper part of the throat there was a large red spot and below this a crescent-shaped dark band and below this again a red one and a dull white belly. The upper-parts were brown and there was a light cream eye-stripe. The bird had a Robin-like stance and its body was nearly parallel with the ground and the head was thrust forward. I had a three-quarter view and the chin was overshadowed by the head so that I could not see its colour.

The bird flew away near the ground and then dived into some thick scrub. I was unable to find it again either on this day or on subsequent ones.

As I have mentioned, the band below the red spot appeared dark and did not show blue as it is in the bird. This was no doubt owing to the light being very bad and an experiment I made later with a coloured picture of a Bluethroat proved that the blue looked blackish at a corresponding distance. This was confirmed by a friend who was with me on the first and subsequent occasions.

M. G. RIDPATH

WHITE-SPOTTED BLUETHROAT SEEN IN KENT.

ON February 2nd, 1942, when I went out of the house at Hothfield, Ashford, Kent, shortly after 9 a.m., I noticed a bird about ten to twelve feet away from me on the snow-covered drive. The light was good, and I had the bird in view for about fifteen seconds before it flew away to an adjacent common.

I wrote out the following description before I looked at my only bird book, a copy of Morris :—(1) Like a Robin, in both size and shape. (2) First seen facing away, for a second or two only—noticed some lightish feathers at the rump or base of tail. (3) Bird then turned and faced me. The breast was a bright blue with a white patch in the centre. This was completely unmistakeable and definite. The patch was oval, with the shorter axis vertical. It was a pure white and gleamed in the sun. (4) My impression of the rest of the plumage was vague as I was so engrossed with the appearance of the breast. The upper-parts were "sparrow-brown" with head and neck perhaps lighter than the back. The under-parts were lightish grey.

My Morris gives a plate of the Bluebreast or Bluethroated Robin, which seemed to fit my description fairly well.

I sent the above description to my brother at Oxford, who showed it to Mr. W. B. Alexander. The latter had no doubt that the bird was a White-spotted Bluethroat. I only regret that this rarity was not seen by a more competent observer.

A copy of this letter is being sent to the Editor of *The Field* (see issue of March 28, 1942, p. 341). BRUCE E. BELFIELD.

[Mr. Belfield has shown us that the blue of the breast ended approximately where it should in the Bluethroat. He did not notice any dividing colour between this and the light grey of the rest of the under-parts, but abrasion may have made the chestnut band inconspicuous and obviously the striking effect of the throat would distract attention from the other details in such a brief view. The "gleaming" white of the central spot is good evidence that the bird was of the white-spotted form, *Luscinia s. cyaneacula*.—EDS.]

BEWICK'S SWANS IN SOMERSET.

THE following observations on Bewick's Swans (*Cygnus b. bewickii*) in north Somerset are given for comparison with Mr. Norris's notes (*antea*, Vol. xxxv, p. 207). On January 12th, 1941, Mr. H. H. Davis and the writer saw two adult

and two young at Blagdon reservoir (*antea*, Vol. xxxiv, p. 264). By an extraordinary coincidence we saw exactly the same number, made up in the same proportions, on January 11th, 1942, within about fifty yards of where we saw them last year.

The young were uniformly greyish, as Mr. Norris has noted, and showed no white in their plumage. We thought they were more grey than brown, and that their bills were yellower, when compared with the 1941 young. But I presume they must have been birds hatched in 1941 and cannot have been eighteen months old.

H. TETLEY.

UNUSUAL BIRDS IN HERTFORDSHIRE.

THE following birds have been identified in Herts and near Tring. On March 21st, 1942, I saw on Marsworth Reservoir four adult Bewick's Swans (*Cygnus b. bewickii*) and a young bird which had probably been hatched in 1941. The Swans were by no means timid, giving excellent views, and the identification was based on the pattern of the yellow on the bill. The call was frequently heard. Continuing my walk along Startops End Reservoir a White-fronted Goose (*Anser a. albifrons*) flew over this reservoir. As the Goose passed over Marsworth the Swans rose and followed it. The white front and the dark markings on the body of the Goose were noticed. Proceeding to Wilstone Reservoir I found among the many Goosanders (*Mergus m. merganser*) one brown-headed Red-breasted Merganser (*M. serrator*) also a Black-necked Grebe (*Podiceps n. nigricollis*), midway between winter and breeding dress, a Sheld-Duck (*Tadorna tadorna*) and two male Common Scoters (*Melanitta n. nigra*). On March 22nd I observed on Marsworth Reservoir a party of nine Scaup-Ducks (*Aythya m. marila*), four males and five females. Between March 21st and 22nd fourteen species of ducks were observed on the reservoirs. About this period there would seem to have been a considerable movement of aquatic birds for while on March 21st there were many Teal, Wigeon and Shovelers over the series of reservoirs three days later the sole representative of these species was one Shoveler.

WILLIAM E. GLEGG.

LONG-TAILED DUCKS INLAND IN SOMERSET.

On January 28th, 1942, whilst watching various wild fowl on Cheddar Reservoir, a bunch of ducks came in suddenly and alighted on the water in good range of my glasses. I easily identified them as an adult male and four female Long-tailed

Ducks (*Harelda glacialis*). The drake was quickly alert and flew off followed closely by the ducks, when I had another fine view of them as they again alighted in the centre of the reservoir. I am aware of some published records of this bird in Somerset, also a few unpublished, but thought that the occurrence of five adults together on an inland lake was sufficiently interesting for publication. STANLEY LEWIS.

KNOT IN SURREY.

As it is unusual to see a Knot (*Calidris canutus*) in the London area, I thought it might be of interest to record that I saw one in grey winter plumage on March 9th, 1942, feeding on the river mud near Barnes Railway Bridge. It was tame and in the company of several gulls. The last Knot I saw in this area was on October 1st-2nd, 1934, at Barn Elms Reservoir.

E. G. PEDLER.

ROSS'S GULL IN SHETLAND.

I NOTE from Vol. v. of the *Handbook* that a Shetland occurrence of Ross's Gull (*Rhodostethia rosea*) in 1936 has not been recorded. A gentleman who inspected the bird while it was in my possession in that year gave me to understand that this was being done. The facts are as follows. While his boat was fishing between the islands of Whalsay and Skerries on April 28th, 1936, John Irvine of Saltness (Whalsay) succeeded in catching the gull, in an exhausted condition, with a scoop net, alongside the boat. It died within a few hours, was skinned and set up by a friend of Irvine and later it was sent to me. Although in immature plumage there is no doubt about its identification, the outstanding features being the very definite wedge-shaped tail and the small bill. In plumage it agrees very well with the plate and description of a 1st winter bird in the *Handbook*.

Quite recently I have been fortunate enough to have a talk with John Irvine about the bird. He knows all sea-birds well and this bird before it was caught attracted his attention by its small size and tern-like flight. After it was caught he was immediately struck by its wedge-shaped tail and small bill and feet.

G. T. KAY.

[A photograph of the stuffed bird sent to us by Mr. Kay confirms his description.—EDS.]

WAXWINGS IN GREAT BRITAIN.—Messrs. N. G. Hadden and E. W. Hendy report that a female Waxwing (*Bombycilla g. garrulus*) frequented a garden at West Porlock (Somerset)

from February 23rd to 28th, 1942. On March 13th possibly the same bird was accidentally killed at Bossington about a mile and a half from West Porlock. One is reported from Cheam (Surrey) on March 14th (D. A. Odd, *Field*, Ap. 11, 1942, p.395).

BUZZARDS IN COS. DUBLIN AND ANTRIM.—With reference to the Buzzard (*Buteo b. buteo*) on Lambay referred to in a review of *In Search of Northern Birds* (cf. *antea*, p. 256) Mr. Seton Gordon informs us that he saw the bird at the end of March, 1937 and he was told that the bird had been there for some time and that it left during April. Mr. K. Williamson (*Irish Nat. Journ.*, 1941, p. 315) reports one seen by him passing over the north side of Belfast Lough on March 19th, 1941.

RUFF IN WINTER IN SOMERSET AND GLOUCESTER.—Mr. H. Tetley informs us that he and Mr. H. H. Davis identified a Ruff (*Philomachus pugnax*) on February 23rd, 1942 on the River Avon near Sea Mills. The bird was seen on both banks of the river so can be claimed by both counties.

GLAUCOUS GULLS IN SCOTLAND AND ENGLAND.—With reference to the reports already published (*antea*, pp. 182-3, 232) on unusual numbers of Glaucous Gulls (*Larus hyperboreus*) Mr. G. T. Kay writes that at Lerwick (Shetland) there were unusual numbers in the winter of 1940-41 from November to February but in the winter of 1941-42 there were fewer. He states that at one favourite feeding place over one hundred adults and immatures were seen in 1940-41 and that sixty-four was the highest count at this place in 1941-42. Only a few immature birds were left by March 3rd. Messrs. S. & J. Ash at Beadnell (Northumberland) noted three adults and twelve immature birds on November 2nd, and subsequently small numbers until February 16th when thirteen were seen, these being the last observed. Mr. T. Bispham reports that the bird seen on the Blackwater on December 7th was an adult and not immature (cf. *antea*, p. 232) and that another (an immature bird) was seen by him and others on the same river on February 8th. Mr. C. R. James saw two immature birds on October 27th at the mouth of the River Medway (Kent) and one or two there or in the Thames Estuary up to January 23rd and an adult in the Medway from January 7th to February 3rd. Mr. W. E. Glegg saw an immature bird at Wilstone Reservoir, Tring (Herts.) on March 6th and Mr. T. Bispham and others saw one near W. Hyde on March 1st and 15th.

ICELAND GULL IN SURREY AND MIDDLESEX.—Mr. T. Bispham and Mr. W. R. Philipson write that an Iceland Gull (*Larus glaucoides*) was seen by several observers on both banks of the River Thames between Barnes Railway Bridge and Hammersmith Bridge on occasions between December 26th, 1941 and March 23rd, 1942. It was thought at first that this was the same bird as that already recorded (*antea*, p. 207), but when seen by the above observers it was found to be distinctly different.

LETTER.

THE WOOD-PIGEON NEST CENSUS.

To the Editors of BRITISH BIRDS.

SIRS,—A national survey of the breeding habitat of the Wood-Pigeon has been organised for this spring and summer. The object of the survey is to find out which parts of the country are most heavily infested with this over-abundant pest, to determine its exact breeding preferences and the density of nests in each habitat, and to confirm the peak period of breeding. Those taking part will fill in a special card for each occupied nest found, and wherever possible the nest will be revisited in order to obtain hatching and fledging data. Census work can be undertaken by individuals working alone, but it also offers exceptional opportunities for team work, so that Natural History Societies, Schools, and the Boy Scouts Association will all be contributing. A leaflet "How to organise a wood-pigeon nest census" is available and should be read by anyone intending to encourage team work.

The census has been purposely designed so that a large number of people can help, even those with little leisure. But it is also hoped that experienced naturalists will do all they can to organise team censuses, so that representative data will be sent in from each county.

Particulars will be sent to Members of the British Trust for Ornithology and to those who have already written concerning the Wood-Pigeon investigation. Others who are interested should apply to this Institute, marking their correspondence Wood-Pigeon investigation.

M. K. COLQUHOUN

Edward Grey Institute,
Museum Road, Oxford.

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